The PHOTOFACT® Servicer

SET 559 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ DEC. 1961

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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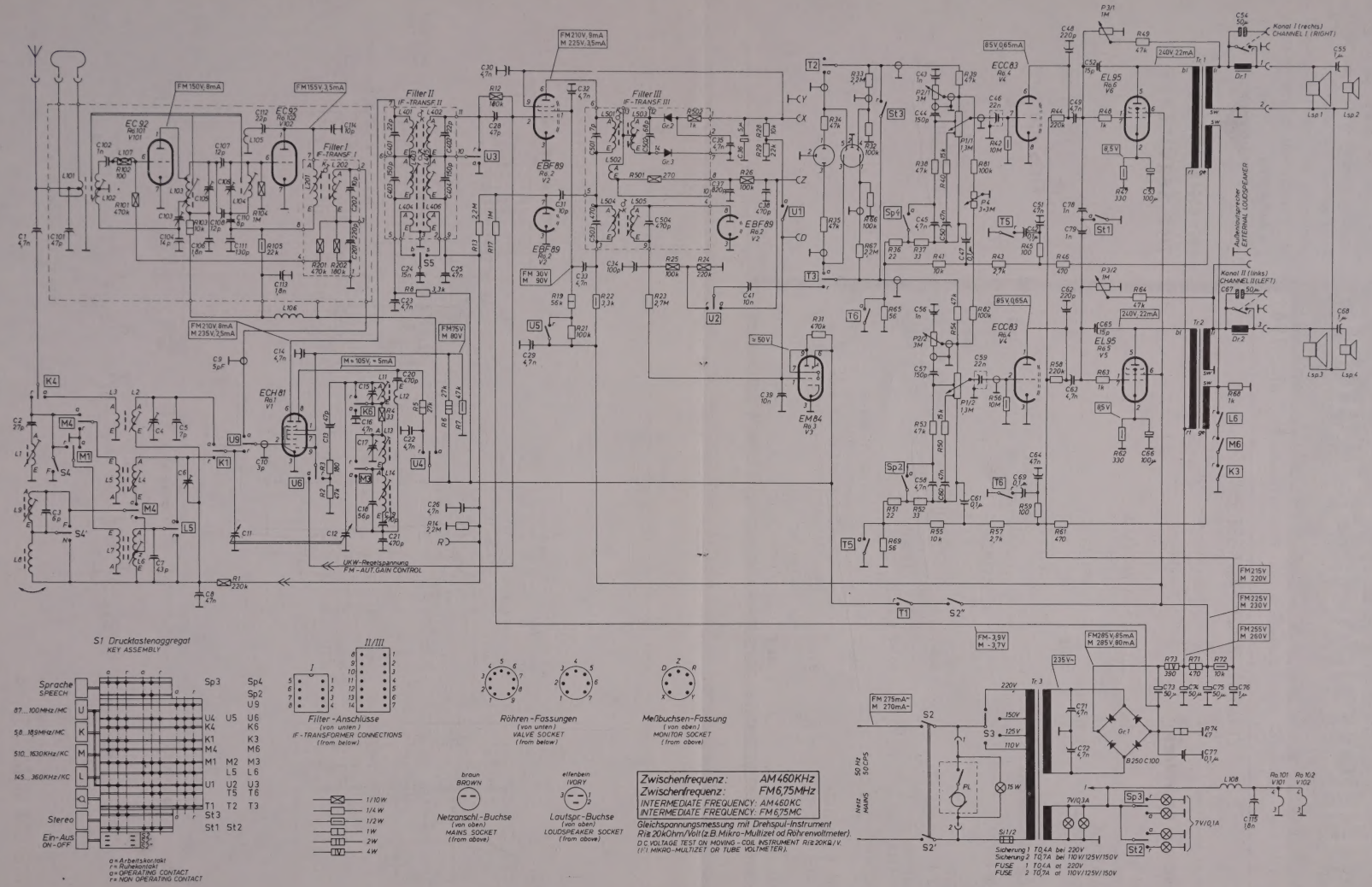
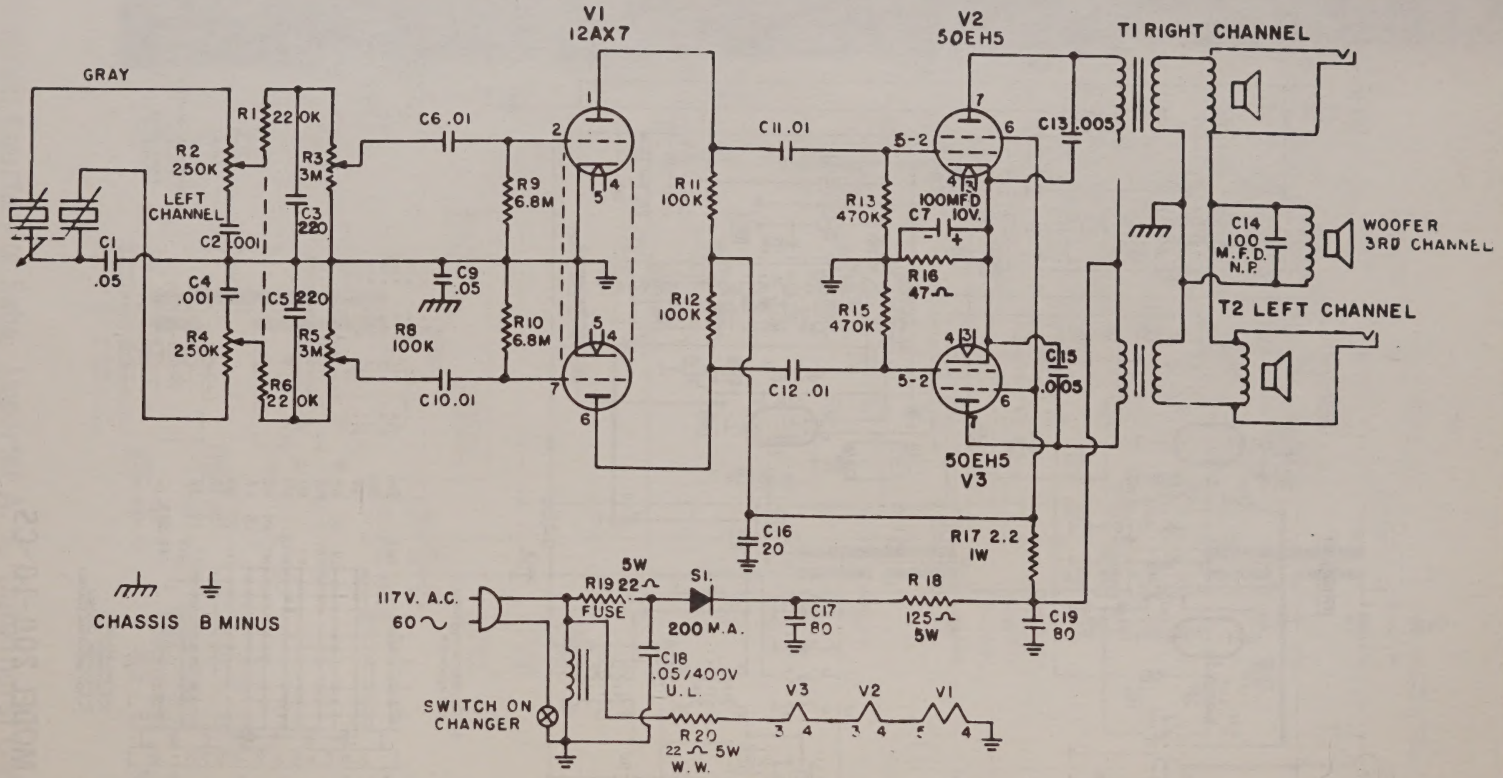


SABA MODEL 200-10-CS

Schematic Diagram Courtesy of Saba: Importer A. E. Dufenhorst Company



FIRESTONE MODEL 13-R-4

Schematic Diagram Courtesy of Firestone Tire & Rubber Company

PHOTOFACT® Folder

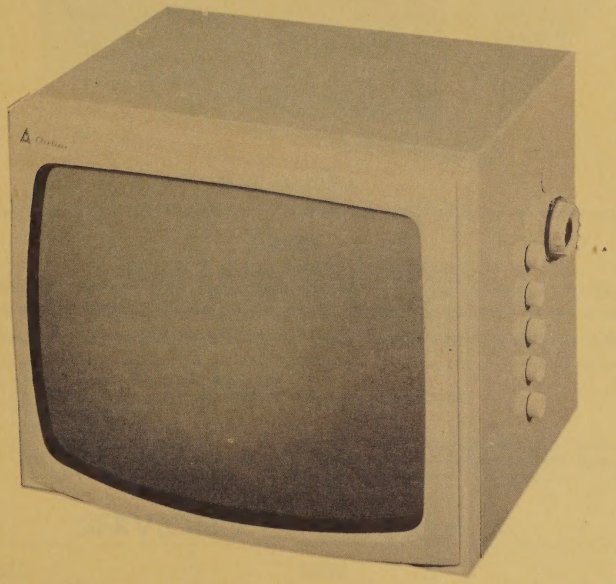
AIRLINE MODELS
WG-4231A, WG-4331A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS
WG-4231A, WG-4331A

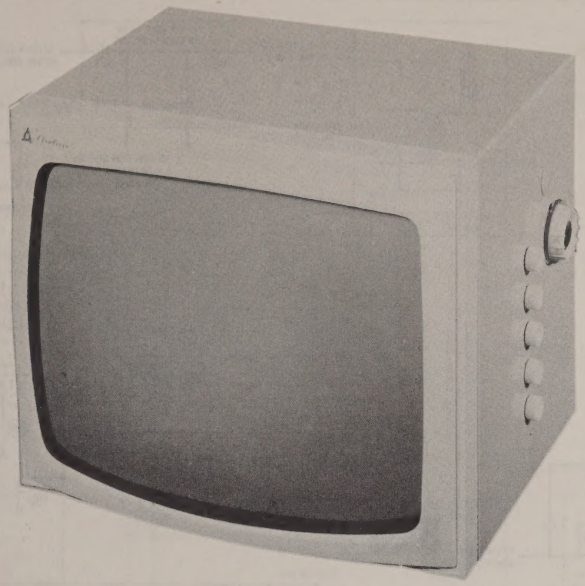


AIRLINE MODELS
WG-4231A, WG-4331A

MODEL WG-4231A

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



MODEL WG-4231A

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Airline, Models WG-4231A, WG-4331A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	VHF - Fourteen, UHF - Fifteen
POWER SUPPLY	110 - 120 Volts AC, 60 Cycle RATING 115 Watts, 1.15 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

It is necessary to remove chassis and picture tube for access to safety glass. See "Disassembly Instructions" page 16.

FUSE DEVICE

A 4.7Ω fusible resistor is used for low voltage power supply protection. (See R58 in Photo "Chassis - Rear View").

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1).

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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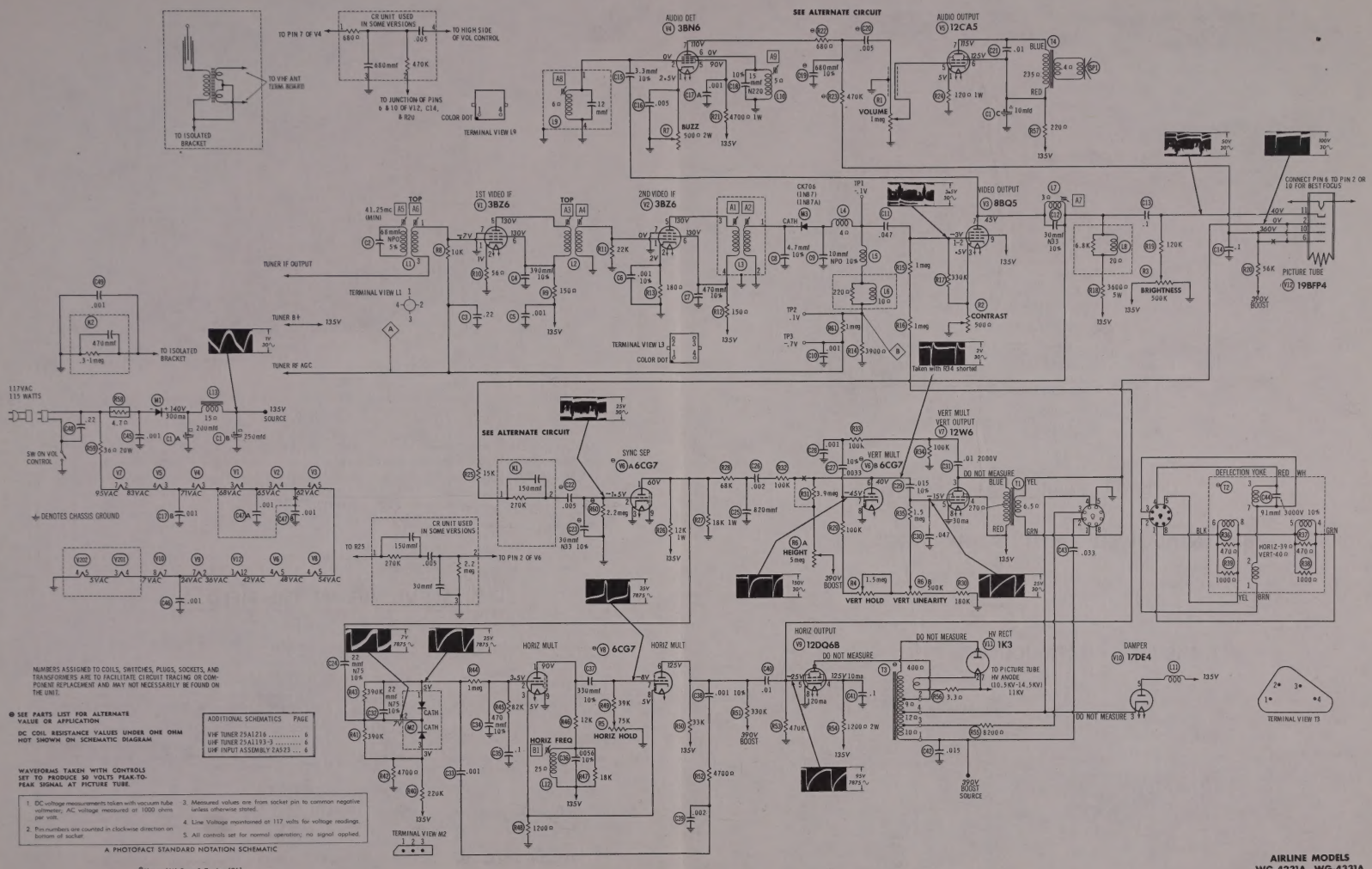
AIRLINE MODELS
WG-4231A, WG-4331A

SET 559 FOLDER 1



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ADDITIONAL SCHEMATICS	PAGE
VHF TUNER 25A1216	6
UHF TUNER 25A1193-3	6
UHF INPUT ASSEMBLY 2A23	6

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative (unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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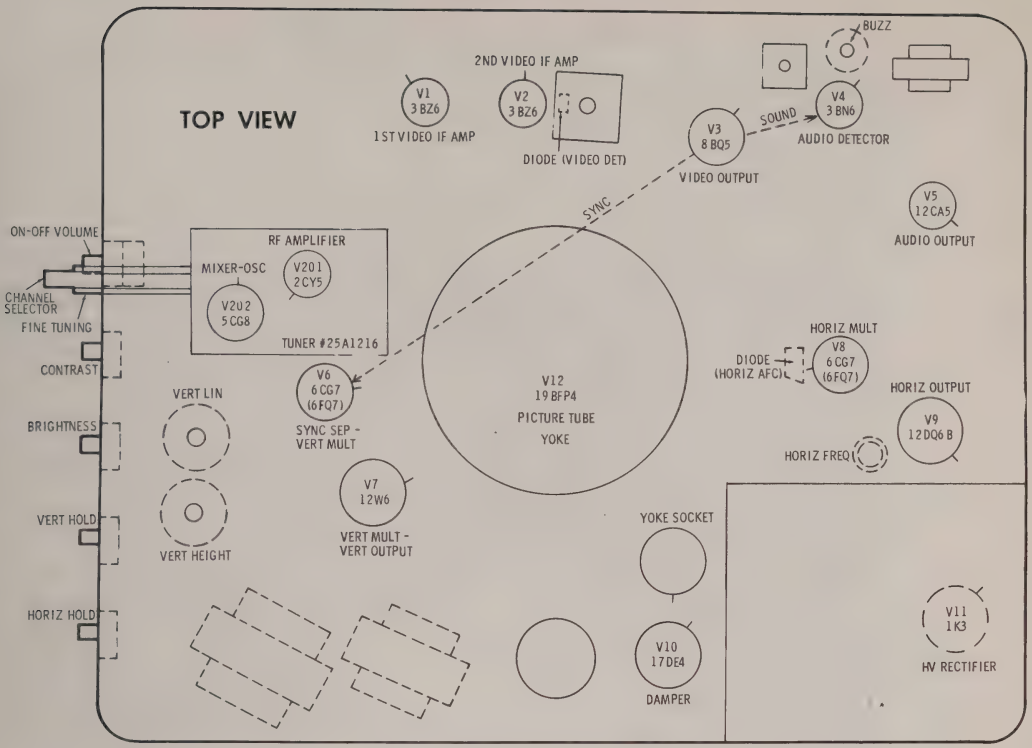
AIRLINE MODELS WG-4231A, WG-4331A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

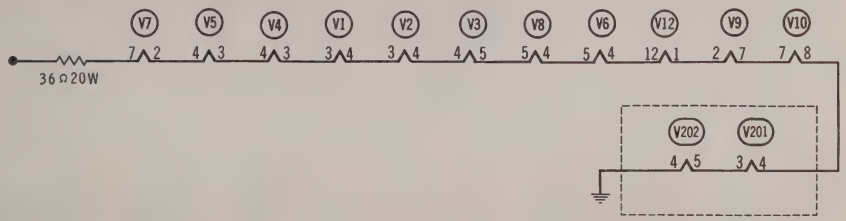
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rectifier M1

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V6, V7
Poor vert. linearity or foldover V6, V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, M1
Vert. off freq. V6, V7
Horiz. off freq. Diode (Horiz. AFC), V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp.)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. Load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	High side thru .01mfd to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

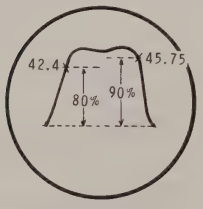


FIG. 1

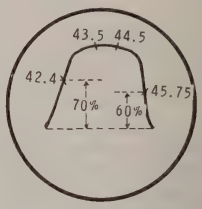


FIG. 2

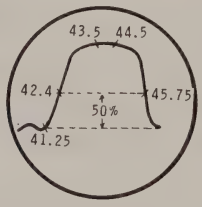
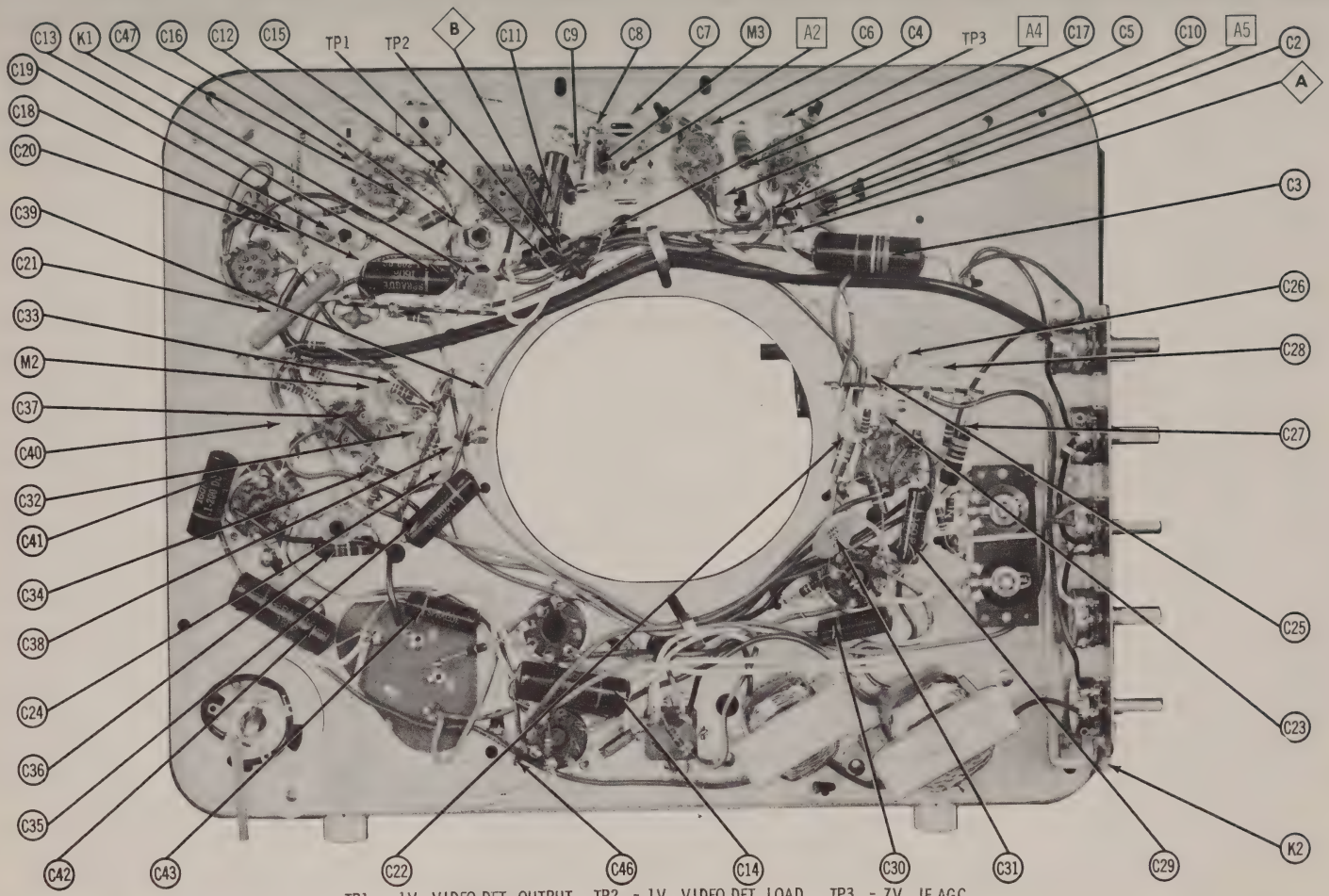
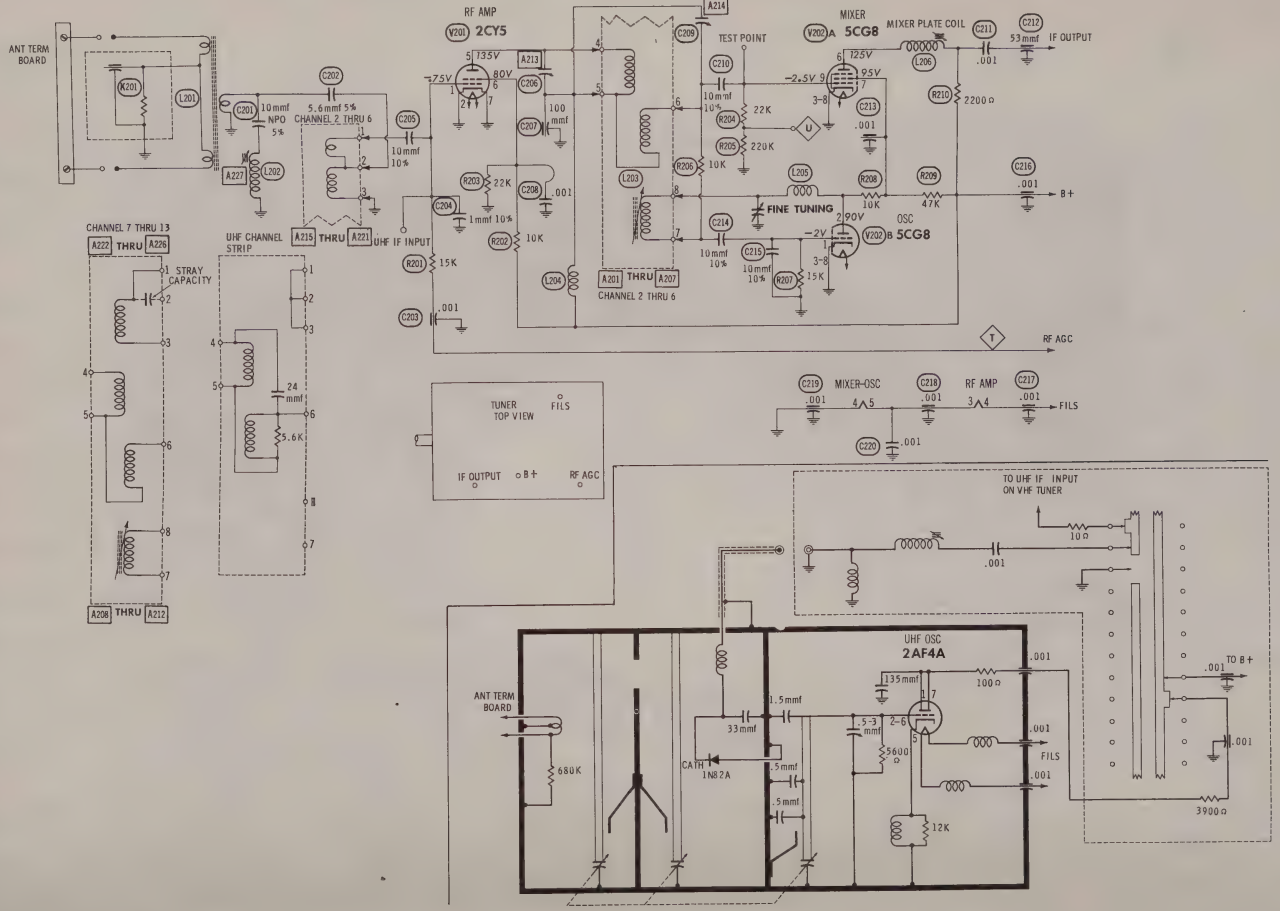


FIG. 3



CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 25A1216, UHF TUNER 25A1193-3, UHF INPUT ASSEMBLY 2A523

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A213, A214 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A202	
		201MC	199.25MC 203.75MC	11		A203	
		195MC	193.25MC 197.75MC	10		A204	
		189MC	187.25MC 191.75MC	9		A205	
		183MC	181.25MC 185.75MC	8		A206	
		177MC	175.25MC 179.75MC	7		A207	
		85MC	83.25MC 87.75MC	6		A208	
		79MC	77.25MC 81.75MC	5		A209	
		69MC	67.25MC 71.75MC	4		A210	
		63MC	61.25MC 65.75MC	3		A211	
		57MC	55.25MC 59.75MC	2		A212	

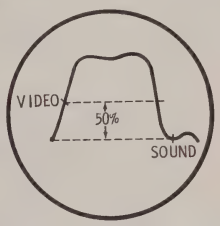


FIG. 201

RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias supply to point (T). Positive to chassis. Set bias for 2.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Common to chassis.	A213, A214.	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202.
3.	"	213MC	211.25MC 215.75MC	13	"	A215	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A216	
		201MC	199.25MC 203.75MC	11		A217	
		195MC	193.25MC 197.75MC	10		A218	
		189MC	187.25MC 191.75MC	9		A219	
		183MC	181.25MC 185.75MC	8		A220	
		177MC	175.25MC 179.75MC	7		A221	
		85MC	83.25MC 87.75MC	6		A222	
		79MC	77.25MC 81.75MC	5		A223	
		69MC	67.25MC 71.75MC	4		A224	
		63MC	61.25MC 65.75MC	3		A225	
		57MC	55.25MC 59.75MC	2		A226	

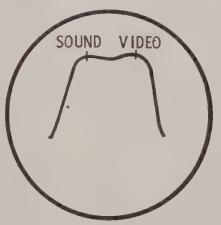


FIG. 202

IF TRAP ADJUSTMENT

Adjust A227 for MINIMUM RF interference.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	3BZ6
V2	2nd Video IF Amp.	3BZ6
V3	Video Output	5BQ6
V4	Audio Detector	3BN6
V5	Audio Output	12CA5
V6	Sync Sep. - Vert. Mult.	6CQ7 (6FQ7) *
V7	Vert. Mult. - Vert. Output	12W6
V8	Horiz. Mult.	6CQ7 (6FQ7) *
V9	Horiz. Output	12DQ6B
V10	Damper	17DE4
V11	HV Rectifier	1K3

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No	GENERAL ELECTRIC PART No	RCA PART No	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V12	19BFP4		19BFP4 [1]			① Aluminized

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: AIRLINE PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	± 200	200	45X445	AFH33-13-90	XH0252	XC3-20	FP38.8	TMD-2260	TVLS-3490*
B	± 250	200			BR1045			TD-10-250	
C	± 10	200							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	68	NPO	5%			DTZ-68	C10Q68C		CNO-468	10TCC-Q68
C3	.22	200V			P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C4	390		10%		DI-390	DD-391	L10T39	CCD-392	GP339	10TS-T39
C5	.001		10%		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	.001		10%		DI-1000	DD-102	PMBDR	CCD-102	GP210	10TS-D10
C7	470		10%		DI-470	DD-471	SR5T47	CCD-471	GP347	10TS-T47
C8	4.7		10%		NPO-4R7 4.7	TCZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-Y47
C9	10	NPO	10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C10	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C12	30	N33	10%	#47X669			*	*	*	
C13	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C14	.1	600V			P568N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C15	3.3		10%		NPO-SI 3.3	TCZ-3R3	C10Y33C	CCTO-3R3	CNO-533	10TCC-Y33
C16	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C17A	.001				BPD-2X001	DD5-102	BYD6DDI	CCD-102	B2X110	5HK-2D10
B	.001							CCD-102		
C18	15	N220	10%					*		
C19	680		10%	Note 1	DI-680	DD-681	SR5T68	CCD-681	GP368	10TS-T68
C20	.005			Note 1	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C21	01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.005			Note 2	BPD-005	DD-502	BYA10S1	CCD-502	B-250	5HK-D50
C23	30	N33	10%	Note 2			*	*	*	
C24	22	N75	10%				*	*	*	
C25	820				DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C26	.002				BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C27	.0033	400V	10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C28	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	.015	600V	10%		V84C6S5-10%		PM6S15	6DP-2-153		6TM-S15
C30	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C31	.01	2000V							2HV-Z10	30GA-S10
C32	22	N75	10%				*	*	*	
C33	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C34	470		10%		DI-470	DD-471	SR5T47	CCD-471	GP347	10TS-T47
C35	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C36	.0056	400V	10%				D2MS56D6	6DP-1-562		6PS-D56
C37	330		10%		1469-00033		SR5T33	CM-1N5-331-K	MC1241	MS-330
C38	.001		10%		DI-1000	DD-102	SR5DI	CCD-102	GP210	10TS-D10
C39	.002				BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C40	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C42	.015	600V			P568N-015	DD-153	CUB6S15	6DP-2-153		6TM-S15
C43	.033	400V			P488N-033	DD-303	CUB4S33	4DP-2-333	GEM-4133	6TM-S33
C44	91	3000V	10%						3DY-310	30TY-T15
C45	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C46	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C47A	.001				BPD-2X001	DD5-102	BYD6DDI	CCD-102	B2X110	5HK-2D10
B	.001							CCD-102		
C48	.22	400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C49	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Airline Part Number.
Note 1. Some versions use component combination unit (Pt. #76X37) for C19, C20, R22, R23.
Note 2. Some versions use component combination unit (Pt. #76X44) for C22, C23, R80, & K1.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	36X433	B-69	A47-1meg-S	Q11-137	U54	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			SW-12	SWE-12	76-1	US-26	Power Off-On
R2	500Ω	½	40X505	B-415		Q17-105	U52R	Contrast
R3A	500K	½	40X506	B-59	A47-500K-S	Q11-133	U50	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	1.5meg	½	40X507	B-742	A47-1.5meg-S	Q11-138	U155	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	75K	½	40X511	B-35	A47-75K-S	Q11-125	TA15L	Horiz. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	5meg	½	40X508	T7-87	B47-5meg-S	HLC-5	PTA56L	Height
B	500K	½		T7-59	B47-500K-S	BH-133	PTA55L	Vert. Linearity
C	Shaft			Not Req.	Not Req.	TM6	Not Req.	
R7	500Ω	2(WW)	40X472			110-600	PFL-600	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No	WORKMAN TV PART No	REMARKS
R8	10K			
R9	150Ω			
R10	56Ω			
R11	22K			
R12	150Ω			
R13	180Ω			
R14	3900Ω			
R15	1meg			
R16	1meg			
R17	330K			
R18	3600Ω 5W	PW5-3600	5W-SQ-3600	
R19	120K			
R20	56K			
R21	4700Ω 1W			
R22	680Ω			Note 1
R23	470K			Note 1
R24	1200 1W			
R25	15K			
R26	12K 1W			
R27	18K 1W			
R28	68K			
R29	100K			
R30	180K			
R31	3.9meg			
R32	100K			
R33	100K			
R34	100K			
R35	1.5meg			
R36	470Ω			
R37	470Ω			
R38	1000Ω			
R39	470Ω			
R40	220K			
R41	390K			
R42	4700Ω			
R43	390K			
R44	1meg			
R45	82K			
R46	12K			
R47	18K			
R48	1200Ω			
R49	39K			
R50	33K			
R51	330K			
R52	4700Ω			
R53	470K			
R54	1200Ω 2W			
R55	3200Ω			
R56	3.3Ω			
R57	220Ω			
R58	4.7Ω †	FR 5.0	F 4.7	#43X431
R59	36Ω 20W			#43X402
R60	2.2meg			Note 2
R61	1meg			

Note 1. Some versions use component combination unit (Pt. #76X37) for R22, R23, C19, C20.
Note 2. Some versions use component combination unit (Pt. #76X44) for R60, C22, C23, & K1.
† Fusible Type # Airline Part Number

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	Sync Sep. Grid	150mmf, 270K	Note 1	Centralab PC-60 Aerovox PA-431
K2	Control Isolation	470mmf, .3-1meg	76X18	Centralab RC-471 Sprague ACL-1

Note 1. Some versions use component combination unit (Pt. #76X44) for K1, R60, C22, C23.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	1st Video IF	9A2436	TV-156	6221	RTC-8552	TC250	① Wound on 220Ω Resistor.
B	41.25MC Trap					TC223	② Wound on 6800Ω Resistor.
L2	2nd Video IF	9A2390					
L3	3rd Video IF	9A2486			*	T989	
L4	RF Choke (16uh)	9A2432				T318	* Parallel with 220Ω Resistor.
L5	Peaking (290uh)	36A22	TV-185	6155	RTC-8587	T305 *	
L6	Peaking (110uh)	36A19 ①	TV-184 *	6153 *	RTC-8574 *	T249	
L7	4.5MC Trap	9A2366	TV-151	1469	RTC-8602	T319 ▲	▲ Parallel with 6800Ω Resistor.
L8	Peaking (350uh)	36A28 ②	TV-190 ▲	6132 ▲	RTC-8577 ▲	T247	
L9	Sound IF	9A2434	TV-155	1470-A	RTC-8604	T251	
L10	Quadrature	9A2367	TV-121	1480	RTC-8605	T856	
L11	RF Choke (1.5uh)	9A2380	BC-562	4604	RTC-8516		

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L12	Horiz. Stabilizer	9A2487	MWC-12	6315	WC-18	WC-14	WLC-3	T110	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(.)	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L13	.300A	15Ω	.5 Hy.	52X102-3		C-2343		C-34X	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	51X193-3	A-2815 ①	VO-109 ①	26S75 ①	A-11TX	
T2	Yoke (Horiz. 25MH) (92°) (Vert. 32MH)	9A-2485-2B	MDF-125	DY-31A ③	Y-45 ③	Y-45-2 ④	
	Alt. Yoke	9A-2485-2					
	Yoke Clamp	30X611					
	Rear Cover and Centering Device						
T3	Horiz. Output	53X398A	HVO-134 *	HO-297 *	FLY-146 *	D-124 *	* Connect same as original.
	Alt. Horiz. Output	53X398					

① Use 6 to 1 Turns Ratio.
② Remove Jumper from across Yoke Plug Pin #7 & #6 and from across Yoke Terminals #1 & #4. Connect same as original.
③ Remove Jumper from across Yoke Terminals #3 & #6 and from across Yoke Plug Pins #7 & #6.
Connect Yoke Terminal #1 to Plug Pin #4; Yoke #2 & #7 to Yoke Plug Pin #3; Yoke #3 to Plug Pin #2; Yoke #4 to Plug Pin #6; Yoke #6 to Plug Pin #1; Yoke #5 & #8 to Plug Pin #5.
④ Remove Jumper from across Yoke Plug Pins #1 & #8. Connect same as original.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	5400Ω	3-4Ω	51X192-3	A-3026	A-3877①	24S48	S-6X	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	12A560-2	4A05	

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: AIRLINE PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.300A	66X23	1N1763	40H	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M2		66X21 ①	6GC1 ①		① Horizontal AFC, Dual Selenium, Common Cathode Video Detector
M3	CK706	66X20		1N87A	
	1N80 ②			1N80	② Alternate Video Detector
	1N87 ②			1N87	
	1N87A ②			1N87A	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuner	25A1216	VHF Complete, STANDARD COIL REPLACEMENT #GGS-422A
	Tuner	25A1193-3	UHF
	Switch	2A523	UHF Input Assembly

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	26A704	With Gasket
Gasket	8X285	Safety Glass
Mask	4X1606-2	
Knob	10A1041-1	UHF Channel Selector (UHF Model)
Knob	10A1043-1	UHF Channel Indicator (UHF Model)
Knob	10A936-3	VHF Channel Selector
Knob	10A937-1	Fine Tuning
Knob	10A1036-2	Volume, Brightness, Contrast, Vertical, Horizontal Hold
Spring	28X836	For Knob (Pt. #10A1036-2)
Cabinet	34X925-1	
Cabinet Back	14X708	

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor) 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
General-use Unshielded Hook-up Wire	Use BELDEN No. 8054
Power Cord (Interlock Type)	Use BELDEN No. 8225
300Ω Tuner Input Lead	Use BELDEN No. 8250 or 8275
300Ω Antenna Lead-in	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor
Antenna Rotor Cable	

AIRLINE MODELS WG-4231A, WG-4331A

FOLDER 1

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2CY5	V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	5.6 5%							10TCC-V56
C203	.001		EF-001	MFT-1000		CCF-102	CT280A	
C204	1mmf 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C205	10 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C206								
C207	100		EF-0001	MFT-100				
C208	.001		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C209								
C210	10 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C211	.001		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C212	53							
C213	.001		EF-001	MFT-1000		CCF-102	CT280A	
C214	10 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C215	10 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C216	.001		EF-001	MFT-1000		CCF-102	CT280A	
C217	.001		EF-001	MFT-1000		CCF-102	CT280A	
C218	.001		EF-001	MFT-1000		CCF-102	CT280A	
C219	.001		EF-001	MFT-1000		CCF-102	CT280A	
C220	.001		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	15K				R206	10K			
R202	10K				R207	15K			
R203	22K				R208	10K			
R204	22K				R209	47K			
R205	220K				R210	2200Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No. *	REPLACEMENT DATA
K201	Antenna Filter		330-1	

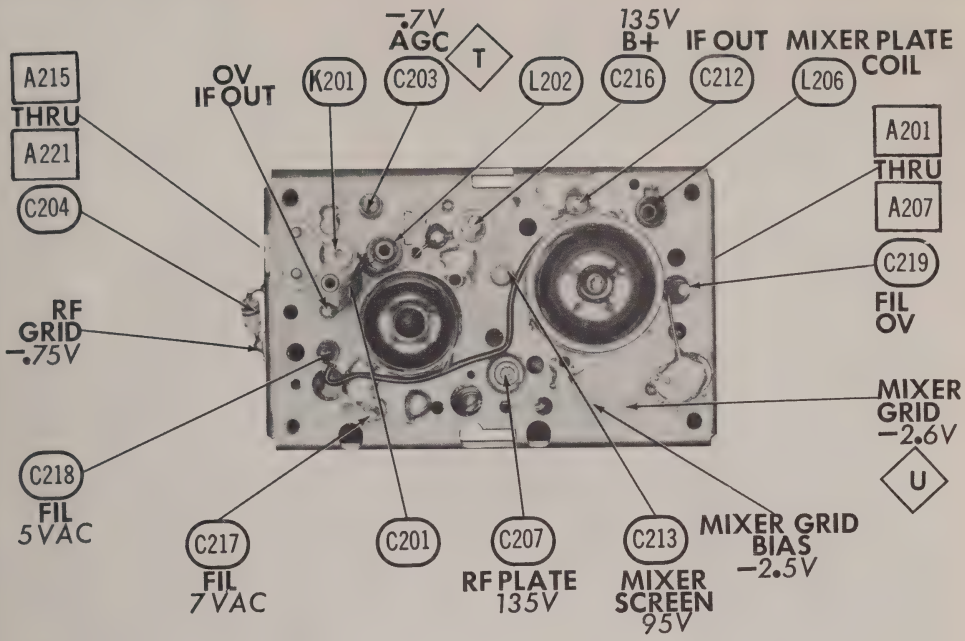
* Sarkes Tarzian Part Number

COILS (RF-IF)

ITEM No.	USE	PART No. *	NOTES
L201	Ant. Trans.	3292-501	
L202	IF Trap	2110-26	
L203A	Ant., RF, Osc.	3262-507	Channel 2
B	"	3263-507	Channel 3
C	"	3264-507	Channel 4
D	"	3265-507	Channel 5
E	"	3266-507	Channel 6
F	"	3267-507	Channel 7
G	"	3268-507	Channel 8

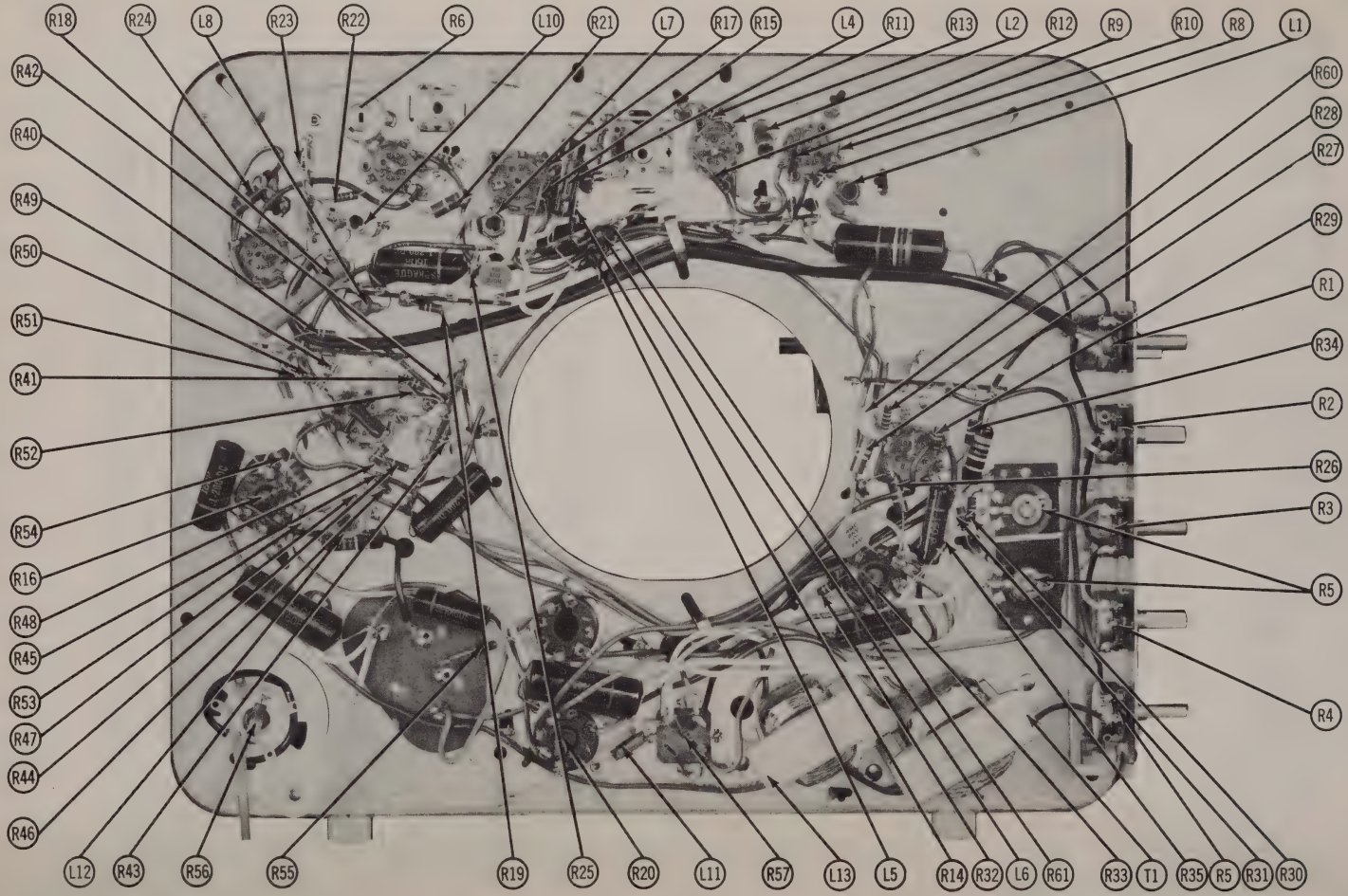
ITEM No.	USE	PART No. *	NOTES
L203H	Ant., RF, Osc.	3269-507	Channel 9
J	"	3270-507	Channel 10
K	"	3271-507	Channel 11
L	"	3272-507	Channel 12
M	"	3273-507	Channel 13
N	"	3261-507	UHF
L204	RF Choke	2321-14	
L205	RF Choke	309-5	
L206	Mixer Plate	2110-30	

* Sarkes Tarzian Part Numbers



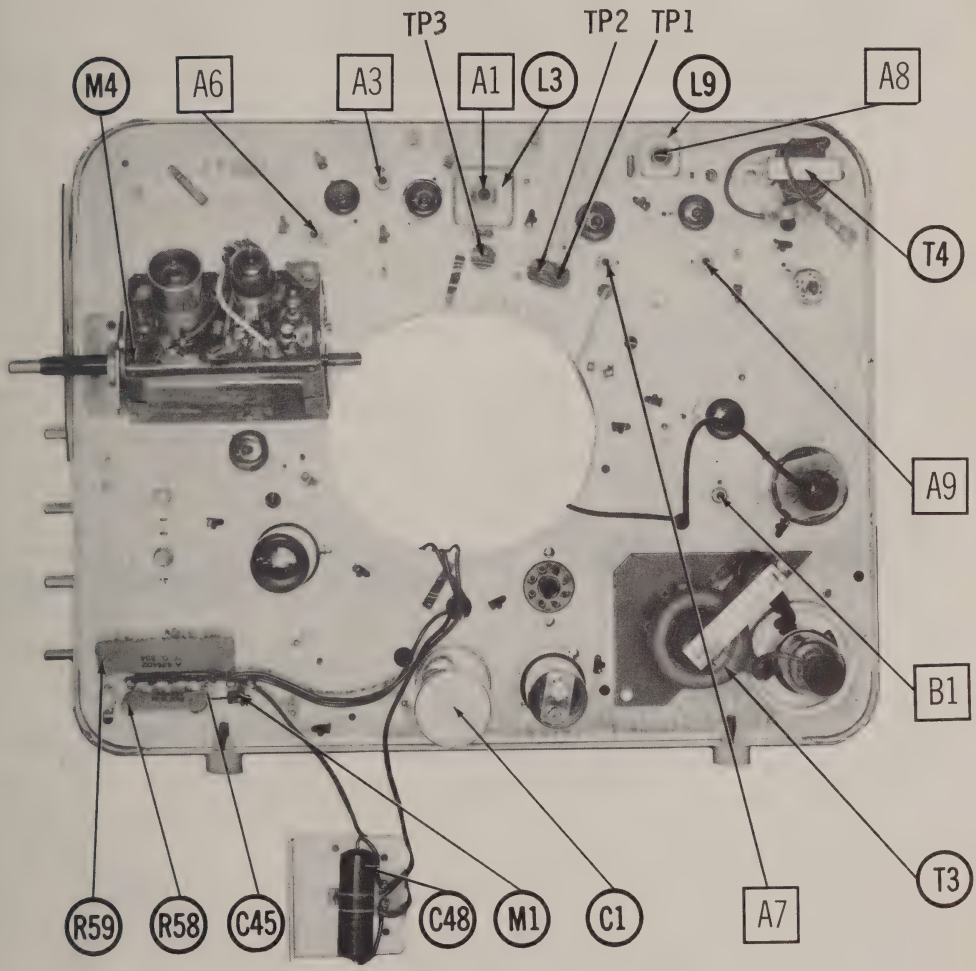
VHF TUNER 25A1216 - TOP VIEW

VHF TUNER 25A1216 - BOTTOM VIEW



CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR, TRANSF. IDENT.

TP1	-.1V	VIDEO DET. OUTPUT
TP2	-.1V	VIDEO DET. LOAD
TP3	-.7V	VIDEO IF AGC



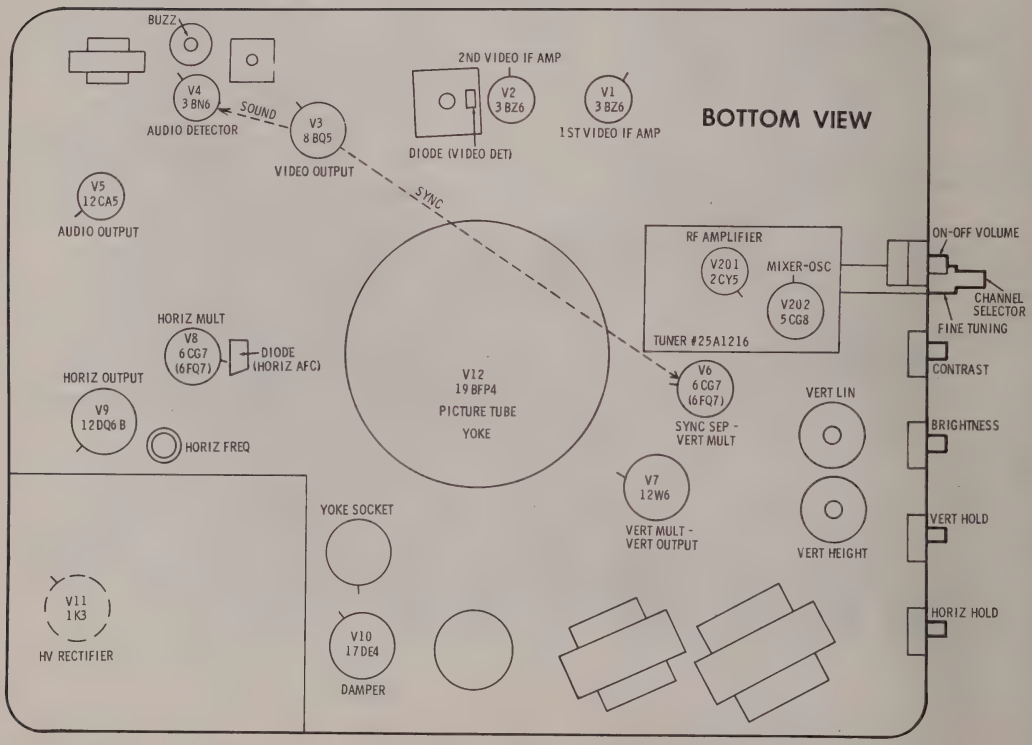
CHASSIS - REAR VIEW

RESISTANCE MEASUREMENTS

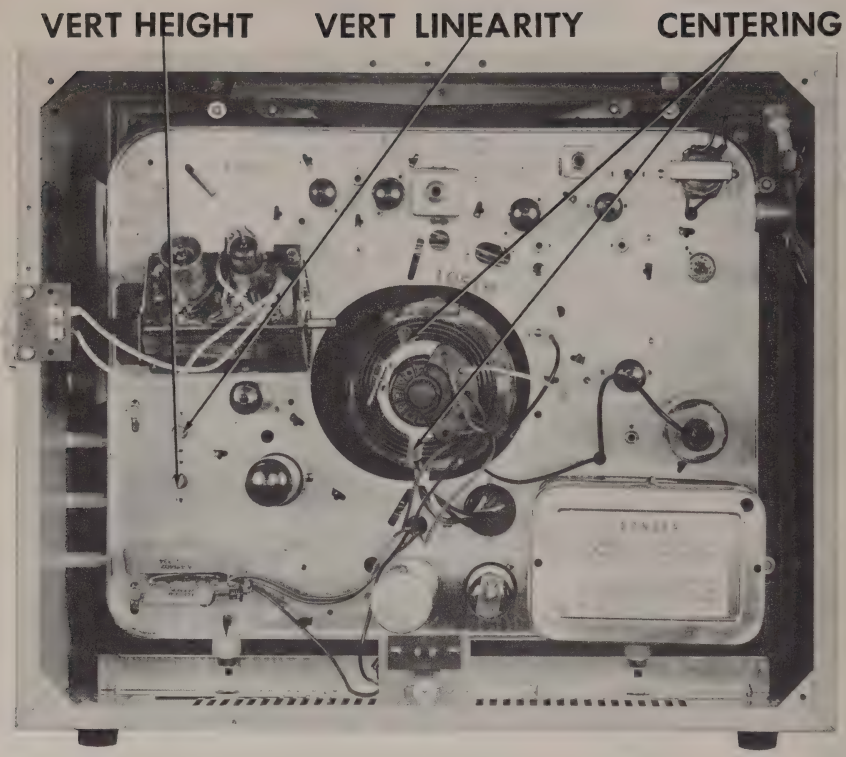
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	1meg	56Ω	51Ω	49Ω	†165Ω	†165Ω	0Ω		
V2	3BZ6	.1Ω	180Ω	49Ω	48Ω	†165Ω	†165Ω	0Ω		
V3	8BQ5	NC	300K	•100Ω	48Ω	42Ω	NC	†3600Ω	NC	†15Ω
V4	3BN6	•250Ω	6Ω	51Ω	54Ω	†4700Ω	5Ω	†530K		
V5	12CA5	120Ω	NC	54Ω	60Ω	•100K	†235Ω	†470Ω		
V6	6CG7	†10K	2.2meg	0Ω	34Ω	38Ω	†•7meg	•1.2meg	0Ω	0Ω
V7	12W6	TP	60Ω	†285Ω	†15Ω	•1.8meg	TP	70Ω	0Ω	
V8	6CG7	†12K	2meg	1200Ω	38Ω	42Ω	†33K	•68K	1200Ω	0Ω
V9	12DQ6B	TP	30Ω	NC	†1200Ω	400K	TP	20Ω	0Ω	TOP CAP †10Ω
V10	17DE4	TP	NC	†360K	NC	†15Ω	TP	20Ω	5Ω	
V11	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †410Ω
V12	19BFP4	30Ω	20Ω	Pin 6 †56K	Pin 10 †56K	Pin 11 •200K	Pin 12 34Ω			
V201	2CY5	1meg	0Ω	4Ω	5Ω	†15Ω	†10K	0Ω		
V202	5CG8	15K	†9400Ω	0Ω	0Ω	4Ω	†2200Ω	†18K	0Ω	240K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V10.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold to the center of its range.

Tune in a TV station and adjust the Horizontal Frequency Slug (B1) until the picture synchronizes horizontally.

Proper adjustment is indicated when it is possible to switch from one channel to another without the picture losing sync.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 screws in rear cover. Remove rear cover.
2. Remove 7 push-on type knobs on side of cabinet.
3. Remove 4 chassis screws and 2 screws holding AC Bracket.
4. Remove 2 screws in upper edge of chassis.
5. Unsolder .001mfd cap at top of chassis edge.
6. Disconnect yoke plug, picture tube socket, speaker leads, and antenna leads.
7. Pull chassis straight out rear.

PICTURE TUBE REMOVAL

It is necessary to remove chassis for picture tube removal.

PHOTOFACT® Folder with CIRCUITRACE®

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

MODEL 192A072RS

SET 559 FOLDER 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

MODEL 192A072RS

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	RCA Victor Models	TV Chassis	Remote Control Receiver, Transmitter	VHF Tuner	UHF Tuner
	192A072MU, 192A075MU, 192A078MU, 192A079MU	KCS137B		KRK104B	KRK66AJ
	192A072MV, 192A075MV, 192A078MV, 192A079MV	KCS137A		KRK103B	
	192A072RS, 192A079RS	KCS137P	KRS25A, KRT3A	KRK102L	

MANUFACTURER	Radio Corporation of America, RCA Victor Home Instruments Division, Indianapolis 1, Indiana
TYPE SET	Television Receiver (Models with Chassis KCS137P use Remote Control)
TUBES	TV: VHF - Sixteen, UHF - Seventeen Remote Control Receiver: Four Tubes, 1 Transistor
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING TV with Remote: 160 Watts, 1.5 Amp. @ 117 Volts AC (175 Watts, 1.7 Amp. While Tuning)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE

A .4 Amp. fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

Remote Control Models: To touch up VHF Oscillator, remove Touch Channel Selector knob and escutcheon.
Models Without Remote Control:
Remove Channel Selector knob (also Fine Tuning in some versions) to touch up VHF Oscillator.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

SYNC STABILITY

Sync stability may be varied by means of a Sync Stability Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Stabilizing Coil Slug. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Coil Slug. (See "Tube Placement Chart" for location.)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

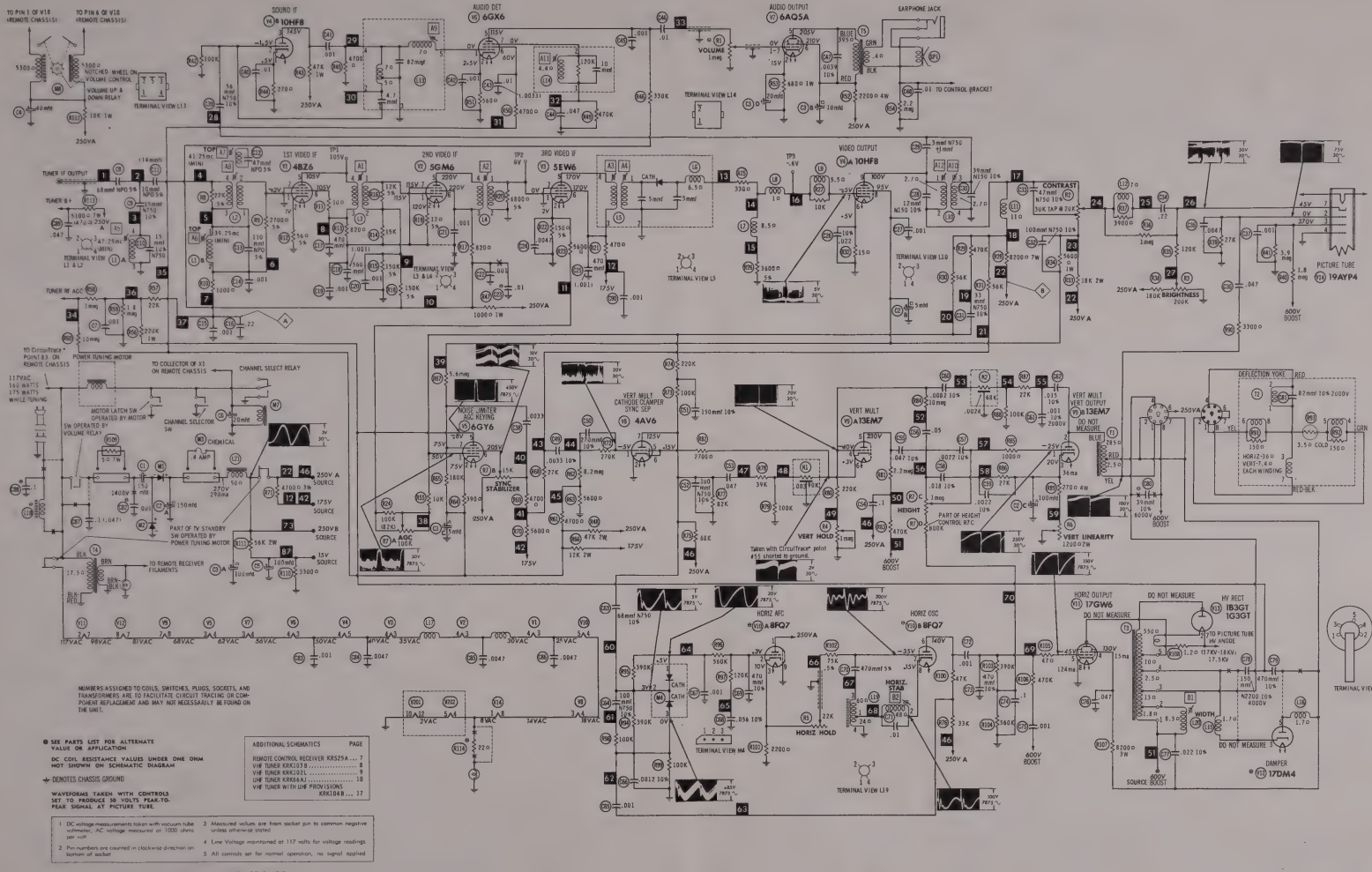
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

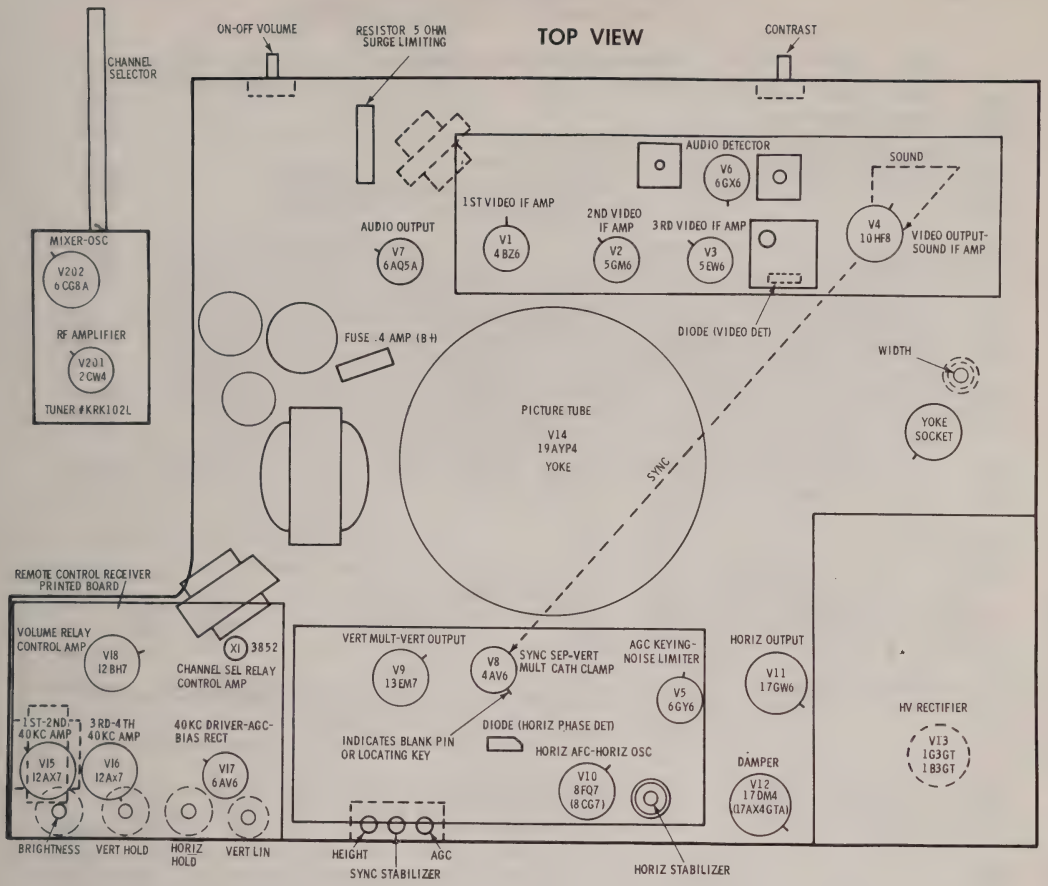
LA215

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

SET 559 FOLDER 2


SOUND IF
AUDIO DET
AUDIO OUTPUT
EARPHONE JACK
VOLUME
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO OUTPUT
CONTRAST
BRIGHTNESS
PICTURE TUBE
TUNER IF OUTPUT
TUNER B+
TUNER RF AGC
POWER TUNING MOTOR
CHANNEL SELECT RELAY
CHANNEL SELECTOR SW
VOLUME RELAY
MOTOR LATCH SW
CHEMICAL
TO REMOTE RECEIVER FILAMENTS
NOISE LIMITER AGC KEYING
SYNC STABILIZER
AGC
VERT MULT CATHODE CLAMPER SYNC SEP
VERT MULT
VERT MULT VERT OUTPUT
DEFLECTION YOKE
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ AFC
HORIZ OSC
HORIZ HOLD
HORIZ OUTPUT
HV RECT
DO NOT MEASURE
WIDTH
DAMPER
SOURCE BOOST
600V BOOST
250V A
250V B
175V
15V
TERMINAL VIEW L3
TERMINAL VIEW L10
TERMINAL VIEW L11
TERMINAL VIEW L13
TERMINAL VIEW L14
TERMINAL VIEW M
TERMINAL VIEW T3
TO CONTROL BRACKET
TO CIRCUITRACE * POINT 83 ON REMOTE CHASSIS
TO COLLECTOR OF X1 ON REMOTE CHASSIS
TO PIN 1 OF W18 (REMOTE CHASSIS)
TO PIN 6 OF W18 (REMOTE CHASSIS)
NOTCHED WHEEL ON VOLUME CONTROL
VOLUME UP & DOWN RELAY
PART OF TV STANDBY SW OPERATED BY POWER TUNING MOTOR
SW OPERATED BY VOLUME RELAY
PART OF HEIGHT CONTROL R7C
Taken with CircuiTrace* point #55 shorted to ground.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
DENOTES CHASSIS GROUND
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured on 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
ADDITIONAL SCHEMATICS PAGE
REMOTE CONTROL RECEIVER KRS25A ... 7
VHF TUNER KRK1038 ... 8
VHF TUNER KRK1021 ... 9
UHF TUNER KRK68AJ ... 10
VHF TUNER WITH UHF PROVISIONS KRK104B ... 17
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1961
RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

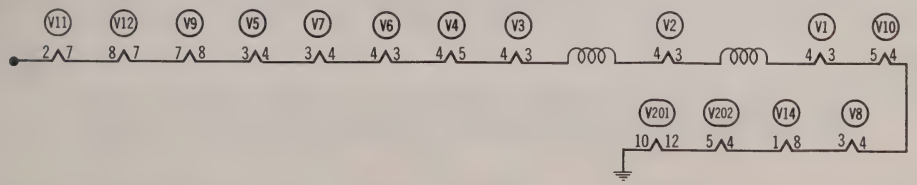
POWER SUPPLY FAILURE
No raster, no sound — Resistor, Fuse (B+), Rectifiers M1, M2 (Surge Limiting)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, M1, M2
Vert. off freq. V9
Horiz. off freq. Diode (Horiz. Phase Det.), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V8
No horiz. sync V8
No vert. or horiz. sync V8

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



TV ALIGNMENT INSTRUCTIONS

ALIGNMENT IDENTIFICATION PHOTO PAGE 20

PRE-ALIGNMENT INSTRUCTIONS

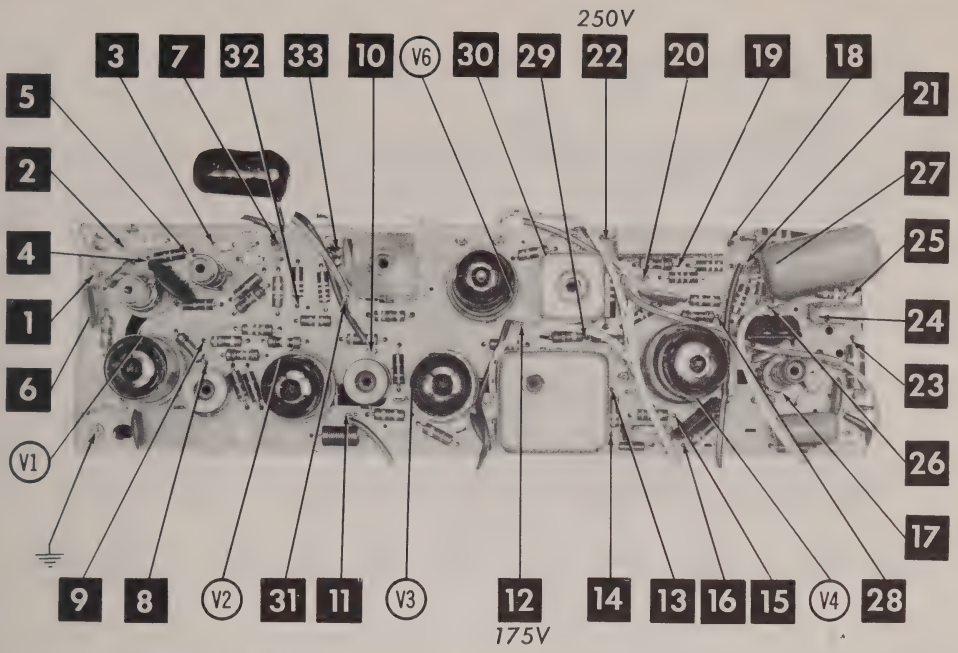
USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A11, A13 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A12 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Connect a clip lead from point Ⓐ to chassis.
Couple signal generator loosely to sweep cable to provide markers.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru 1500mmf ceramic capacitor to Mixer Grid Test Point. Low side to chassis.	Not Used	45.5MC	Any non-interfering channel.	Use VTVM DC probe thru 10K to TP-3. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	43.0MC	"	"	A2	"
3.	"	45MC (10MC Swp.)	41.25MC 45.75MC	"	Vert. Amp. thru 10K to TP-3. Low side to chassis.	A3, A4	Connect the negative lead of a 3.5 volt bias supply to RF AGC. Positive to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Use 5 volts peak to peak on scope.
4.	"	Not Used	47.25MC	"	Use VTVM DC probe thru 10K to TP-3. Common to chassis.	A5	Adjust for MINIMUM deflection.
5.	"	"	39.25MC	"	"	A6	"
6.	"	"	41.25MC	"	"	A7	"
7.	"	45MC (10MC Swp.)	42.5MC 45.75MC	"	Connect a .001mfd in series with a 180Ω carbon resistor from TP-1 to chassis with the capacitor connected to TP-1. Vert. Amp. of scope thru diode probe to junction of the resistor and capacitor. Low side to chassis.	Mixer Plate Coil & A8	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Use .5 volts peak to peak on scope. Repeat step 4. Remove capacitor and resistor from TP-1.
8.	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to TP-3. Low side to chassis.	A1, A2, A3, A4	Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Use 5 volts peak to peak on scope.
9.	Insert pad (Fig. 4) in series with high side of generator. Connect to same point.	"	45.75MC	"	DC probe of VTVM to TP-3. Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
10.	"	"	41.25MC	"	"	A2, A3, A4	Retouch for 1.2 to 1.5 volts on VTVM while maintaining response similar to Fig. 3.
11.	Across antenna terminals thru matching network (Fig. 5).	Each VHF channel in turn.	42.5MC 45.0MC 45.75MC	All VHF channels	Vert. Amp. thru 10K to TP-3. Low side to chassis.	A1, A3, A4	Check for response similar to Fig. 3. Retouch SLIGHTLY to correct for tilt or other conditions that are approximately the same on all channels.

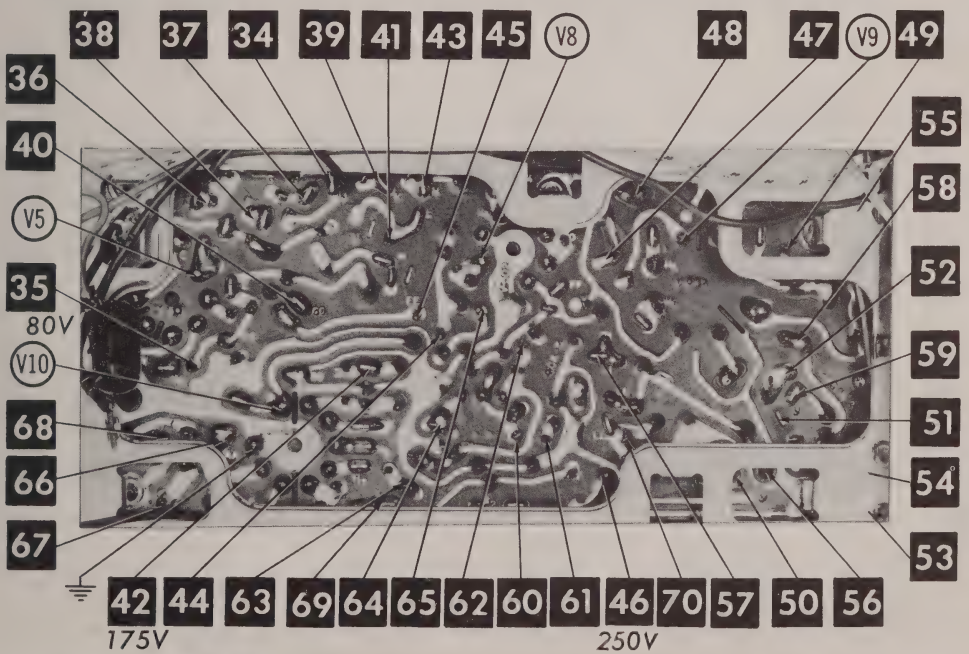
CONTINUED PAGE 21



A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

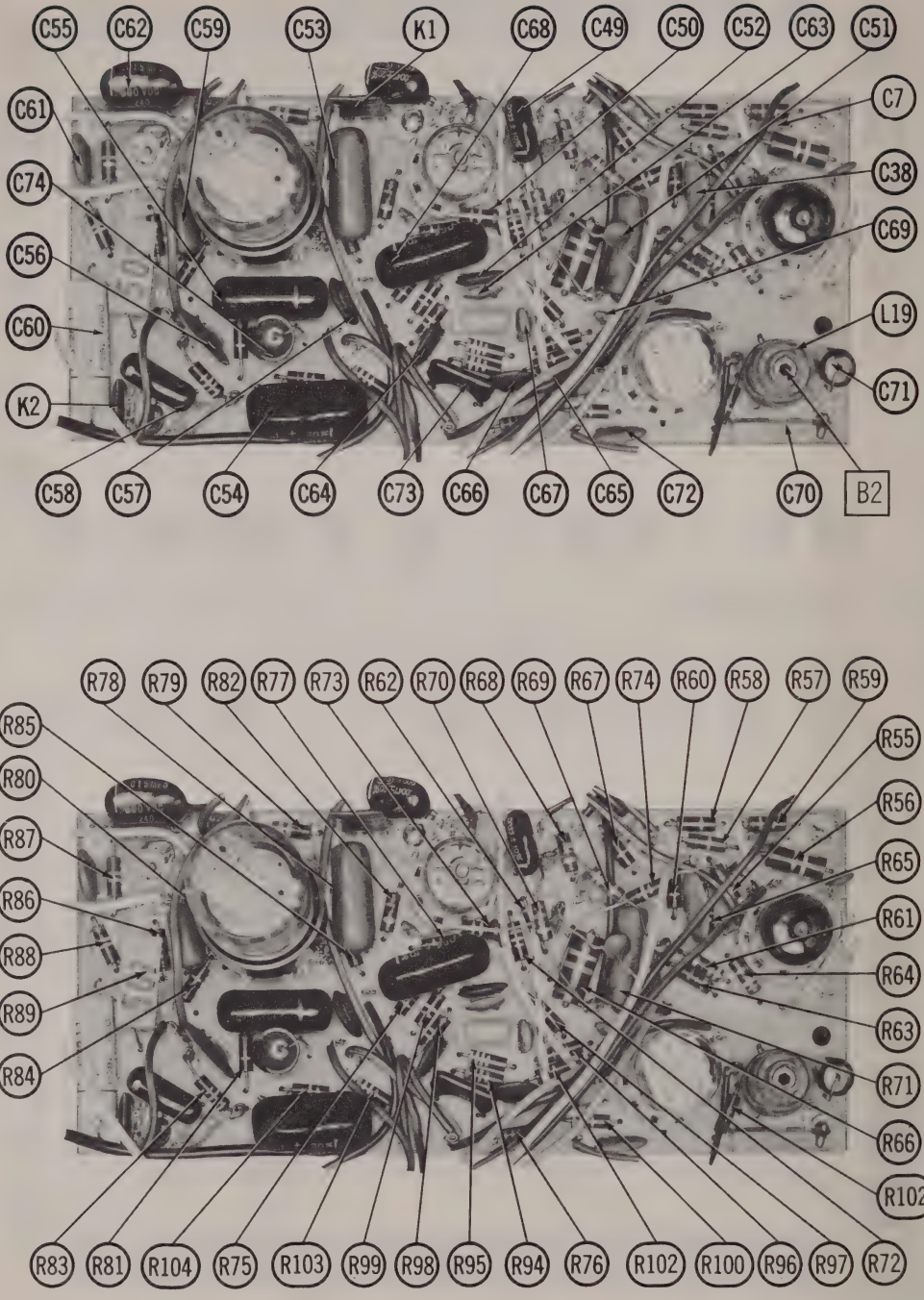
VIDEO, SOUND PRINTED BOARD



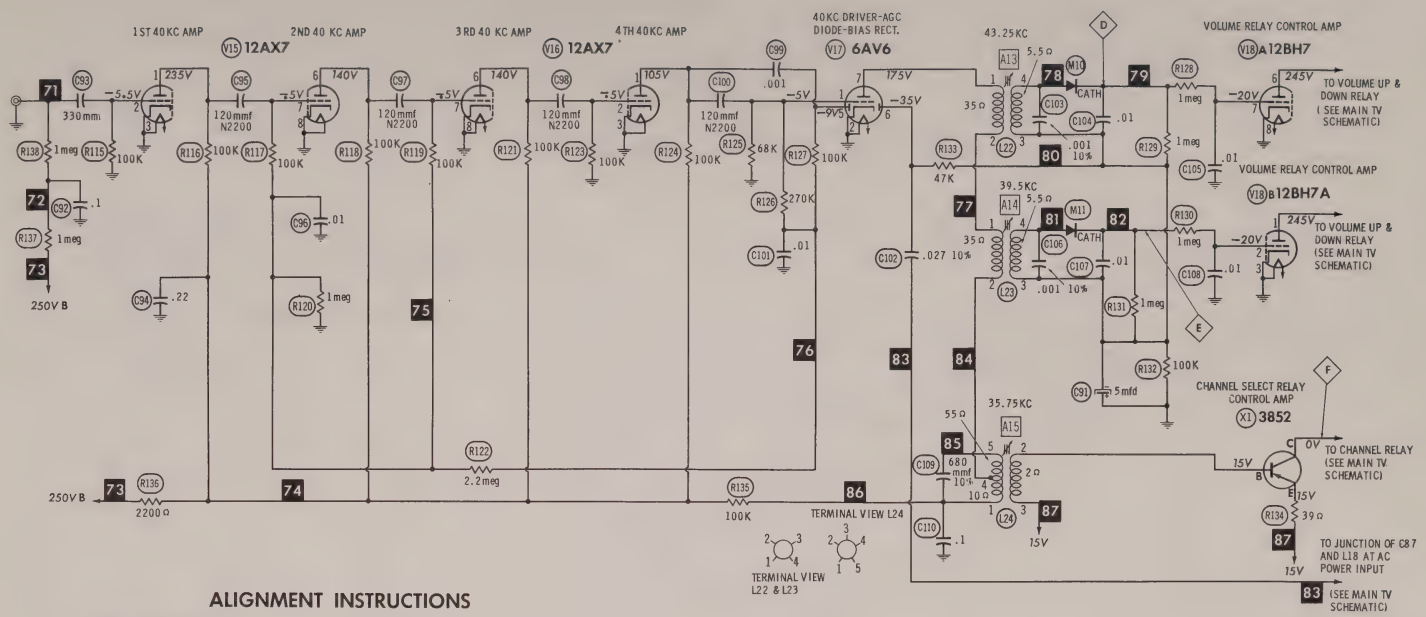
A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SYNC, SWEEP PRINTED BOARD



SYNC, SWEEP PRINTED BOARD



ALIGNMENT INSTRUCTIONS

REMOTE CONTROL RECEIVER

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru 1 meg to microphone recept. Low side to chassis.	43.25KC	DC probe to point (D). Common to chassis.	A13	Adjust for maximum deflection. Use only enough generator output to provide a usable indication.
2.	"	39.50KC	DC probe to point (E). Common to chassis.	A14	"
3.	"	35.75KC	DC probe to point (F). Common to chassis.	A15	"

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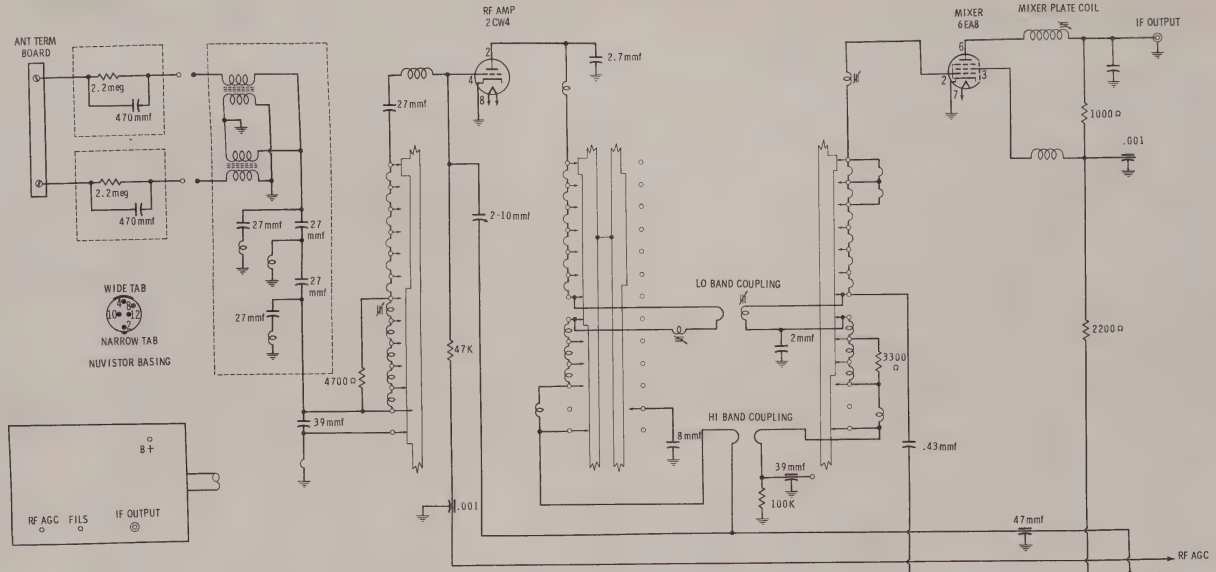
REMOTE CONTROL RECEIVER KRS25A

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A



ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Set Fine Tuning so that the Channel 13 Oscillator Adjustment Slug may be reached thru the hole in Fine Tuning Cam. Turn receiver on and tune in highest channel operating in the area. Adjustments must be made in descending order from the highest channel operating in the area to the lowest. Adjust proper slug for best picture and sound. See Fig. 201 for proper adjustment screw location.

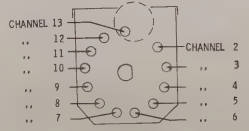


FIG. 201

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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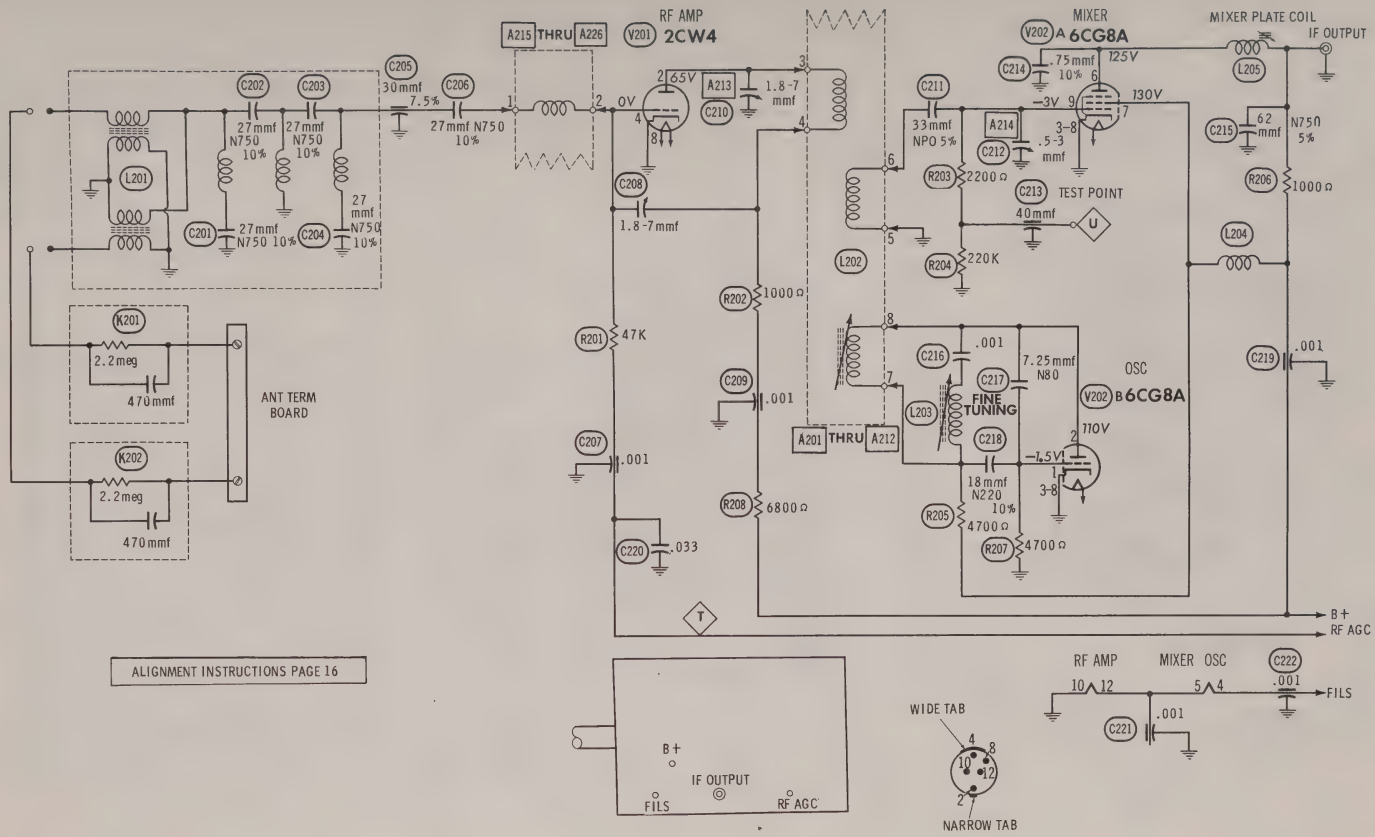
VHF TUNER KRK103B



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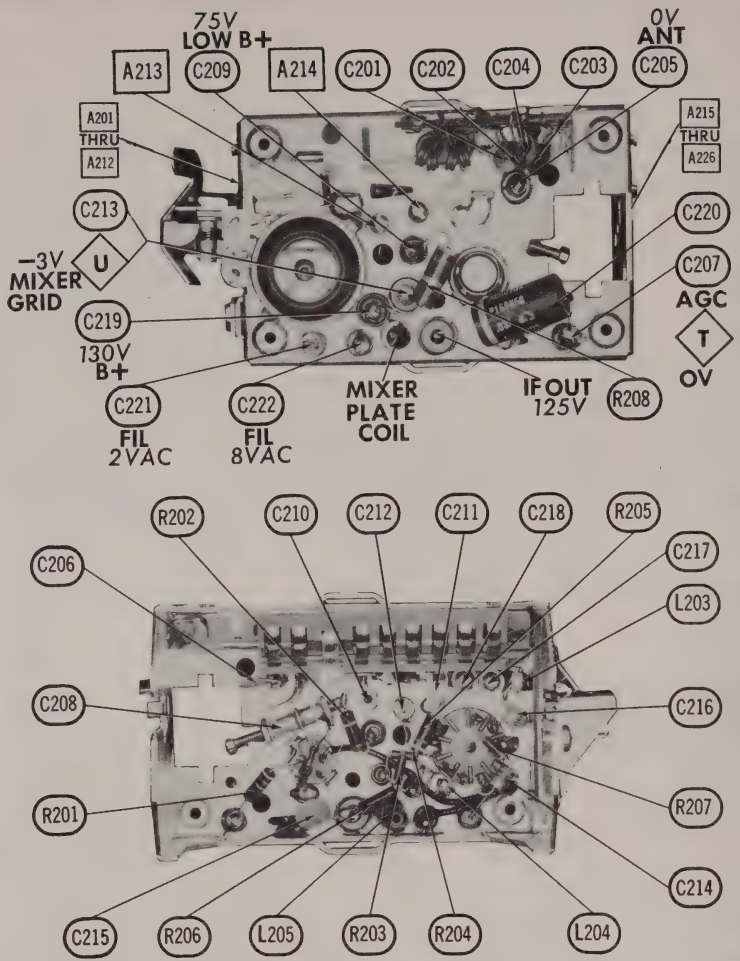
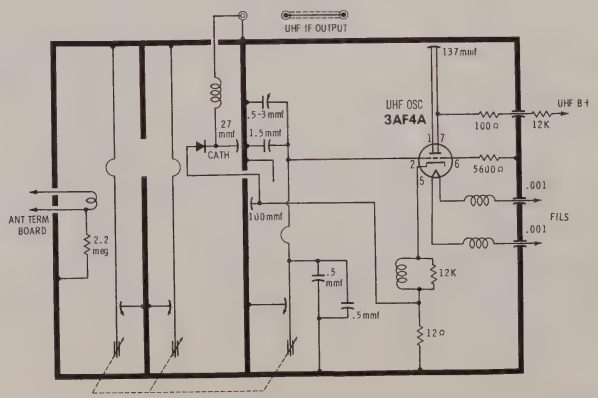
VHF TUNER KRK102L

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KR525A, KRT3A



VHF TUNER KRK102L



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER KRK66AJ

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	4BZ6	V8	Vert. Mult. Cath. Clamper - Sync Separator	4AV6
V2	2nd Video IF Amp.	5GM6	V9	Vert. Mult. - Vert. Output	13EM7
V3	3rd Video IF Amp.	5EW6	V10	Horiz. AFC - Horiz. Osc.	8FQ7 (8CG7) *
V4	Video Output - Sound IF Amp.	10HF8	V11	Horiz. Output	17GW6
V5	AGC Keying - Noise Lim.	6GY6	V12	Damper	17DM4 (17AX4GTA)*
V6	Audio Detector	6GX6	V13	HV Rectifier	1G3GT/1B3GT
V7	Audio Output	6AQ5A			

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	19AYP4		19AYP4 ①		19AYP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	150	200	107472	AFH1-25-70		XC1-14	WP125.9	TD-150-200	TVLS-1539 *
C2A	▲150	350	109933	AFH3-112-77	B0334	XC4-11	WP420.25	TMD-2440	TVL-2643
B	■5	350			BR1005			TD-100-50	TVA-1310
C	▲100	50							
C3A	▲100	350	109689	AFH4-56-60	D0473.3	XC4-14	FP420.405	TMQ-4268	TVL-4632
B	■10	350							
C	▲5	150							
D	20	25							
C4	40	400	112099	PRS1750	BR4045	QT1-14	TC78	TD-40-450	TVA-1712
C5	100	25	108020	PRS1270	BBR100-25	QT1-23	TC2501	TD-100-25	TVA-1207
C6	20	12	106735	PTT55	NLW20-15	MT1-10	TT15X20	MLV20-12	TE-1130

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	68	NPO	5%			DTZ-68	C10Q68C	CM-19B-680J	CNO-468	10TCC-Q68
C9	15	N750	10%		N750-SI 15	TCN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C10	15	N750	10%		N750-SI 15	TCN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C11	10	NPO	5%	(14) †	NPO-SI 10	TCZ-10	C10Q1C	CCTQ-100	CNO-410	10TCC-Q10
C12	47	NPO	5%			DTZ-47	C10Q47C	CM-19B-470J	CNO-447	10TCC-Q47
C13	110	NPO	5%			TCZ-110		CM-19B-111J	CNO-312	10TCC-T12
C14	.001				SI-1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	.001				SI-1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	.22	200V			P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C17	470				SI 470	D6-471	BYA10T47	CCD-471	B-347	10TS-T47
C18	560			(.001) †	DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C19	.001				SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	.001				SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	.01			Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	.0047				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	470			(.001) †	DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C26	.022	200V	10%		V84C2S22-10%		PM4S22	4DP-2-223	GEM-1612	2TM-S22
C27	.001				SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C28	12	N150	10%	#109932				*		10TCP-Q12
C29	3	N750	±1mmf			TCN-3R3			CN7-533	10TCU-V33
C30	39	N150	10%	#109931				*		10TCP-Q39
C31	33	N750	10%		N750-SI 33	TCN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C32	100	N750	10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C33	47	N750	10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C34	.22	600V			P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C35	.0047	600V			P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C36	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C37	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C38	.0033				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C39	56	N750	10%		N750-SI 56	TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C40	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	.001				SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C42	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C43	.01			(.0033) †	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-D10
C44	.047	200V			P488N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C45	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C46	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C47	.0039		10%		DI-4000		DPMSD39	CCD-392	JL-239	10TS-D39
C48	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	.0033	600V	10%		V84C6D33-10%		PM6D33	6DP-1-332	JL-233	6TM-D33
C50	270		10%		DI-270	DD-271	L10T27	CCD-271	GP347	10TS-T27
C51	150		10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C52	100	N750	10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-315	10TCU-T10
C53	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C55	.047	600V	10%		V84C6S47-10%		PM6S47	6DP-3-473	GEM-1615	6TM-S47
C56	.05				BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C57	.0022		10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C58	.018	400V	10%		P684CM-018		PM4S2	4DP-2-203	GEM-1612	4TM-S20
C59	.0022	600V	10%		V84C6D22-10%		PM6D22	6DP-1-222	GP222	6TM-D22
C60	.0082	400V	10%		V84C6D82-10%		DPMS6D82	6DP-2-822	GEM-16282	6PS-D82
C61	.001	2000V	10%	#104222						
C62	.015	600V	10%				PM6S15	6DP-2-153		6TM-S15
C63	68	N750	10%		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C64	100	N750	10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C65	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C66	.0012	10%		DI-1200	DD-122	DPM56DI2	CCD-122	GP312	10TS-D10
C67	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C68	.056 600V	10%		P68G3M-057		DPM56S56	6DP-3-563		6PS-S56
C69	470	10%		DI-470	DD-471	5RST47	CCD-47I	GP347	10TS-T47
C70	470	5%		1469-00047		5RST47	CM-19B-47IJ	MCJ344	MS-347
C71	.01 400V			P68N1-01	D6-103	CUB4I	6DP-I-103	GEM-6II	6TM-B10
C72	.001			BPD-001	DD-103	BYA10DI	CCD-102	B-210	5HK-D10
C73	470	10%		1469-00047		5RST47	CM-19B-47IJ	MCJ344	MS-347
C74	.1 200V			P2B3N-1	DF-104	CUB2P	3DP-3-104	GEM-201	2TM-P10
C75	.001			BPD-001	DD-102	BYA10DI	CCD-103	B-210	5HK-D10
C76	.047 600V			P68N-047	DD-503	CUB6S47	6DP-3-473	GEM-6I47	6TM-S47
C77	.022 600V	10%		V84CS22-10%		P68S22	6DP-3-223	GEM-6I22	6TM-S22
C78	150 4000V N2200	10%	Not Used						
C79	470	10%		DE-470	DD-47I	5RST47	CCD-47I	GP347	10TS-T47
C80	39	5000V 10%	Note 1					6DY-439	
C81	82	2000V 10%	#107419			HVA20Q82		2DY-482	
C82	.001	1600V	Note 1	DAC-2*		HVB15DI	3CCD-102	UAC-210	BL-D10
C83	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C84	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C85	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C86	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C87	1	600V	(.047) †	P68N-1	DF-104	CUB6PI	6DP-4-104	GEM-601	6TM-P10
C88	1	600V	Note 1	P68N-1	DF-104	CUB6PI	6DP-4-104	GEM-601	6TM-P10
C89	.047	600V		P68N-047	DD-503	CUB6S47			
C90	.001			BPD-001	DD-102	BYA10DI	CCD-102	GP210	10TS-D10

† Alternate Value # RCA Victor Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. May not be used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	½	112134 ①					Volume
R2A	30K	½	109937			B20-121X		Contrast
B	20K Tap							
	Shaft					SKI		
R3A	200K	½	109934	TT-46	B47-200K-8	B11-139	TA354L	Brightness
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R4A	1meg	½	109936	TT-69	B47-1meg-8	B11-137	TA18L	Vert. Hold
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R5	22K	½	109935	TT-26	B47-25K-8	B11-130	TA253L	Horiz. Hold
	Shaft			Not Req.	Not Req.	TM6	Not Req.	
R6A	1200Ω	2(9W)	109939	WN-152	A43-1500	WPR1500	R1500L	Vert. Linearity
B	Shaft			Not Req.	FKB-1/4	Not Req.	Not Req.	
R7A	100K	1 10	109958					AGC
B	15K	1 10						Sync Stabilizer
C	1meg	1 10						Height
D	800K	1 10						Height Limiter

I Used in Chassis KCS137P. Chassis KCS137A, B use Part #109938.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R8	22K 5%			
R9	2700Ω 5%			
R10	1000Ω			
R11	150			
R12	560 5%			
R13	820Ω			
R14	15K			
R15	150K 5%			
R16	12K 5%			
R17	820Ω			
R18	150K 5%			
R19	120 5%			
R20	680Ω 5%			
R21	470Ω			
R22	150Ω 5%			
R23	5600Ω			
R24	100K			(82K) *
R25	330Ω			
R26	3600Ω 5%			
R27	10K			
R28	8200Ω 7W	PW7-8200	7W-SQ-8200	
R29	470K			
R30	56K			
R31	56K			
R32	150			
R33	18K 2W			
R34	5600Ω 1W			
R35	120K			
R36	1meg			
R37	3900Ω			
R38	180K			
R39	27K			
R40	1.8meg			
R41	3.9meg			
R42	100K			
R43	47K 1W			
R44	270Ω			
R45	4700Ω			
R46	330K			
R47	1000Ω 1W			
R48	47K 2W			
R49	470K			
R50	4700Ω			
R51	560Ω			
R52	2200Ω 4W	PW5-2200	5W-SQ-2200	
R53	680Ω 1W			
R54	2.2meg			
R55	10K			
R56	220K 1W			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R57	22K			
R58	1meg			
R59	1.8meg			
R60	10meg			
R61	4700Ω			
R62	8.2meg			
R63	5600Ω			
R64	390Ω			
R65	180K			
R66	12K 2W			
R67	5.6meg			
R68	27K			
R69	4700Ω			
R70	5600Ω			
R71	4700Ω 3W	PW3-4700	3W-SQ-4700	
R72	270K			
R73	100K			
R74	220K			
R75	68K			
R76	33K			
R77	82K			
R78	39K			
R79	100K			
R80	220K			
R81	2.2meg			
R82	2700Ω			
R83	470K			
R84	10meg			
R85	1000Ω			
R86	27K			
R87	22K			
R88	100K			
R89	270Ω 4W	PW5-270	5W-SQ-270	
R90	3300Ω			
R91	150Ω			
R92	150Ω			
R93	3.5Ω Cold			#107464
R94	390K			
R95	390K			
R96	560K			
R97	120K			
R98	100K			
R99	100K			
R100	47K			
R101	2200Ω			
R102	75K 5%			
R103	390K			
R104	560K			
R105	47Ω			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R106	470K			
R107	8200Ω 3W	PW3-8200	3G-8200	
R108	1.2Ω			
R109	5Ω 7W	PW7-5	7W-SQ-5	
R110	3300Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R111	56K 2W			
R112	10K 1W			
R113	5100Ω 7W	PW7-5100	7W-SQ-5100	Note 1
R114	22Ω			Note 2

* Alternate
# RCA Victor Part Number

Note 1. 470Ω in Chassis KS137A, B.
Note 2. May not be used in some versions.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K1	Vert. Integrator	.003mfd, 80K	109326	Centralab PC-407 Sprague V-15
K2	Vert. Feedback	.0024mfd, 68K	109325	Centralab PC-406 Sprague V-14

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	47.25MC Trap	109322				TB295	
B	39.25MC Trap						
L2A	1st Video IF	109323				TC200	
B	41.25MC Trap						
L3	2nd Video IF	109071				TB298	
L4	3rd Video IF	109158				TB297	
L5	4th Video IF	109332				TB296	
L6	Peaking (35uh)	108758	TV-180	6176	RTC-8573	T301	
L7	Peaking (250uh)	109944	TV-185	6181	RTC-8598	T346	
L8	RF Choke (2.7uh)	107663	SW-830	4606	RTC-8517	T814	
L9	Peaking (72uh)	109943	TV-186	6172	RTC-8590	T339	
L10A	4.5MC Trap	109949	TV-236 †	1471-A †			† Remove Capacitors.
B	Sound Takeoff						
L11	Peaking (390uh)	109945	TV-199	6155	RTC-8587	T348	
L12	Peaking (180uh)	109948	TV-184	6180	RTC-8597	T344	
L13	Sound IF	109951					
L14	Quadrature	109948					
L15	RF Choke (8.2uh)	107385	BC-566	4611	RTC-8521	T960	
L16	RF Choke (8.2uh)	107385	BC-566	4611	RTC-8521	T960	
L17	Fil. Choke (1uh)	73477	BC-561	4602	RTC-8515	T855	
L18	Line Choke	①					① Not used in some versions.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L19A	Horiz. Osc.	109947				HS-19			
B	Horiz. Stabilizer								
L20	Width	109942	MWC-8	6322	WC-8	WC-22	WLC-6	T107	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT (1000 ^μ)	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L21	.290A	50Ω	.7 Hy.	100286		C-2343		C-34X	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	109685		VO-101	26S07	A-140X	
T2	Yoke (Horiz. 18MH) (114°) (Vert. 14MH)	109962		DY-28A ①	Y-47 ①	Y-60-1	① Use original yoke damping network if necessary.
	Yoke Clamp	104409					
T3	Horiz. Output	109961					

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	117V ② .100A	6.3V ② 1.8A		112135	P-2946 ①②	P-8466 ①②	21F40 ②	F-43X ①	

① Drill new mounting hole(s). ② Tape CT on 6.3V winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	8200Ω	3-4Ω	109950	A-2900 ①	A-3856 ①	26S49	S-8X	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	3" x 5"	PM	3-4Ω	107262	35A05	

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: RCA Victor PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.290A	108379	1N1763	40H	
M2	.290A	108379	1N1763	40H	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: RCA Victor PART No. FUSE	RCA Victor PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	Chemical	.4A	109588	109941			GMW	HWA

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: RCA Victor PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M4		109328 *	6GC1 *		* Horiz. AFC, Dual Selenium, Common Cathode Type

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Tuner (KRK02L)	112173	VHF, Complete, Chassis KCS137P
	Tuner (KRK03B)		VHF, Complete, Chassis KCS137A
	Tuner (KRK04B)	112052	VHF with UHF Provisions, Chassis KCS137B
	Tuner (KRK66AJ)	112170	UHF, Chassis KCS137B
M6	Tuner Mounting Assembly	TMA28A	Includes Motor and Gear Assembly Part #112202, Mute Switch Assembly Part #112144, Programmer Switch Assembly Part #112148, and Motor Switch Part #112203
M7	Relay		Channel Selector, Chassis KCS137P
M8	Relay	110218	Volume Selector, Chassis KCS137P
M9	Antenna	109920	2 Required, JFD REPLACEMENT #TA413
	Printed Board	109959	Video and IF, Less Tubes
	Printed Board	109960	Deflection, Less Tubes

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8482 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO. 192A072MU	192A072MV	192A072RS	192A075MU	192A075MV	192A078MU	192A078MV	192A079MU	192A079MV	192A079RS
Safety Glass	109919	X	X	X	X	X	X	X	X	X	X
Mask	112088		X								
Mask	112089	X									
Mask	112137			X							
Mask	112090				X						
Mask	112091					X					
Mask	112092						X				
Mask	112093							X			
Mask	112094									X	
Mask	112095								X		
Knob-VHF Channel Selector	109963 †	X	X				X	X			
Knob-VHF Channel Selector	109964 †				X	X					
Knob-Channel Selector, Fine Tuning	109922 †			X							
Knob-Fine Tuning	109966 †	X	X				X	X			
Knob-Fine Tuning	109965 †				X	X			X	X	
Knob-UHF Tuning	109924 †	X			X		X		X		
Dial-UHF	109929 ††	X			X		X		X		
Knob-Contrast, Volume	109922 †	X	X	X			X	X			
Knob-Contrast, Volume	109923 ♦				X	X			X	X	
Handle (Ivory Only)	109917	X	X	X	X	X	X	X	X	X	X

† Uses Retaining Spring Part #76837.
♦ Uses Retaining Spring Part #109288.
†† Uses Retaining Spring Part #100584.

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V15	1st - 2nd 40KC Amp.	12AX7	V17	40KC Driver - AGC - Bias Rect.	6AV6
V16	3rd - 4th 40KC Amp.	12AX7	V18	Volume Relay Control Amp.	12BH7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	3852	Channel Selector Relay Control Amp.	2N217		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C91	5	50	218513	PTT90	NLW5-50	MT1-3	TT50X5	MLV5-50	TE-1303

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C92	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C93	330			DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C94	.22	400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C95	120	N2200	#105242				*		
C96	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C97	120	N2200	#105242				*		
C98	120	N2200	#105242				*		
C99	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C100	120	N2200	#105242				*		
C101	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C102	.027	400V 10%		P684CM-027		DPMS6S27	6DP-3-273	GEM-1613	6PS-S27
C103	.001	10%		1469-001		5R5D1	CM-19B-102K	MCB255	MS-2i
C104	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C105	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C106	.001	10%		1469-001		5R5D1	CM-19B-102K	MCB255	10TS-D10
C107	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C108	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C109	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C110	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

RCA Victor Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R115	100K			
R116	100K			
R117	100K			
R118	100K			
R119	100K			
R120	1meg			
R121	100K			
R122	2.2meg			
R123	100K			
R124	100K			
R125	68K			
R126	270K			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R127	100K			
R128	1meg			
R129	1meg			
R130	1meg			
R131	1meg			
R132	100K			
R133	47K			
R134	39Ω			
R135	100K			
R136	2200Ω			
R137	1meg			
R138	1meg			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA Victor PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L22	43.25KC	112022					
L23	39.5KC	112022					
L24	35.75KC	112021					

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M10		106952			Bias Regulator
M11		106952			Bias Regulator

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Printed Board	112184	Remote Control Receiver, Less Tubes

REMOTE CONTROL TRANSMITTER PARTS LIST AND DESCRIPTIONS

KRT3A

REMOTE CONTROL TRANSMITTER

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Tuning Rod	109995	Volume Up (43.25KC)
	Tuning Rod	109997	Volume Down (35.75KC)
	Tuning Rod	109996	Channel Selector (39.50KC)
	Clip (Tuning Rod)	109999	6 Required
	Top Case Assembly	112003	
	Bottom Case Assembly	112004	
	Selector (Channel)	112005	3 Required
	Grille (Cabinet)	112002	

VHF TUNER PARTS LIST AND DESCRIPTIONS

KRK102L

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •		• SYLVANIA •
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2CW4	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30 7.5%	#107876						
C206	27 N750 5%			TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27 *
C207	.001		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7			829-7				
C209	.001		EF-001	MFT-1000		CCF-102	CT280A	
C210	1.8-7	#109598		829-7				
C211	33 NPO 5%			TCZ-33	C10Q33C		CNO-433	10TCC-Q33
C212	.5-3			829-3		CV-1	CT565	
C213	40	#107881						
C214	.75 10%	#109425						
C215	62 N750 5%			TCN-62	C10Q62U	CCTN-620		
C216	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C217	7.25 N80	#109424						
C218	18 N220 10%	#107884				*		10TCR-Q18
C219	.001		EF-001	MFT-1000		CCF-102	CT280A	
C220	.033 200V		P288N-033	DD-303	DPMS4S33	4DP-2-333	GEM-4133	4PS-S33
C221	.001		EF-001	MFT-1000		CCF-102	CT280A	
C222	.001		EF-001	MFT-1000		CCF-102	CT280A	

RCA Victor Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	4700Ω			
R202	1000Ω				R206	1000Ω			
R203	2200Ω				R207	4700Ω			
R204	220K				R208	6800Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K201	Antenna Filter	470mmf, 2.2meg	109956	
K202	Antenna Filter	470mmf, 2.2meg	109956	

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L201	Ant. Trans.	109615	Complete Ass'y
L202A	Ant., RF, Mixer & Osc.	109599	Channel 2
B	"	109600	Channel 3
C	"	109601	Channel 4
D	"	109602	Channel 5
E	"	109603	Channel 6
F	"	109604	Channel 7
G	"	109605	Channel 8

ITEM No.	USE	RCA Victor PART No.	NOTES
L202H	Ant., RF, Mixer & Osc.	109606	Channel 9
J	"	109607	Channel 10
K	"	109608	Channel 11
L	"	109609	Channel 12
M	"	109610	Channel 13
L203	Fine Tuning	107888	
L204	RF Choke		
L205	Mixer Plate	109619	

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

KRK102L

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Suggested Alignment Tools: A201 thru A212 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A213, A214 ..... GENERAL CEMENT #8697, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓣ. Positive to chassis.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Set the Fine Tuning to the Center of its range.
Connect a 39 ohm composition resistor in series with a 1000mmf capacitor across the tuner output jack.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across VHF antenna terminals thru matching pad (See Fig. 201).	257MC	13	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.	A201	Adjust for zero beat.
	"	251MC	12	"	A202	"
	"	245MC	11	"	A203	"
	"	239MC	10	"	A204	"
	"	233MC	9	"	A205	"
	"	227MC	8	"	A206	"
	"	221MC	7	"	A207	"
	"	129MC	6	"	A208	"
	"	123MC	5	"	A209	"
	"	113MC	4	"	A210	"
	"	107MC	3	"	A211	"
	"	101MC	2	"	A212	"

VHF RF AND MIXER ALIGNMENT

Connect Bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Leave tuner output jack terminated as under "VHF Oscillator Alignment".

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Across VHF antenna terminals thru matching pad (Fig. 201).	195MC (10MC Swp.)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.	A213, A214	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown.
	"	213MC	211.25MC 215.75MC	13	"	A215	If necessary, adjust to correct for improper tilt.
	"	207MC	205.25MC 209.75MC	12		A216	Adjust by expanding or compressing coil turns.
	"	201MC	199.25MC 203.75MC	11		A217	"
	"	195MC	193.25MC 197.75MC	10		A218	"
	"	189MC	187.25MC 191.75MC	9		A219	"
	"	183MC	181.25MC 185.75MC	8		A220	"
	"	177MC	175.25MC 179.75MC	7		A221	"
	"	85MC	83.25MC 87.75MC	6		A222	"
	"	79MC	77.25MC 81.75MC	5		A223	"
	"	69MC	67.25MC 71.75MC	4		A224	"
	"	63MC	61.25MC 65.75MC	3		A225	"
	"	57MC	55.25MC 59.75MC	2		A226	"

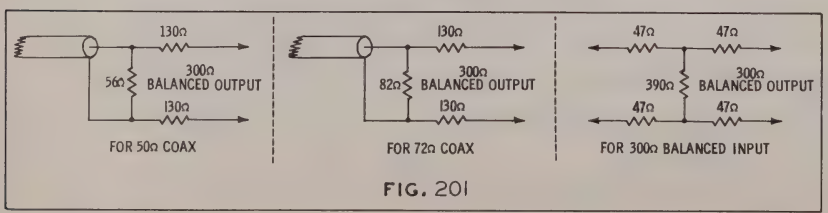

FIG. 201

FIG. 202

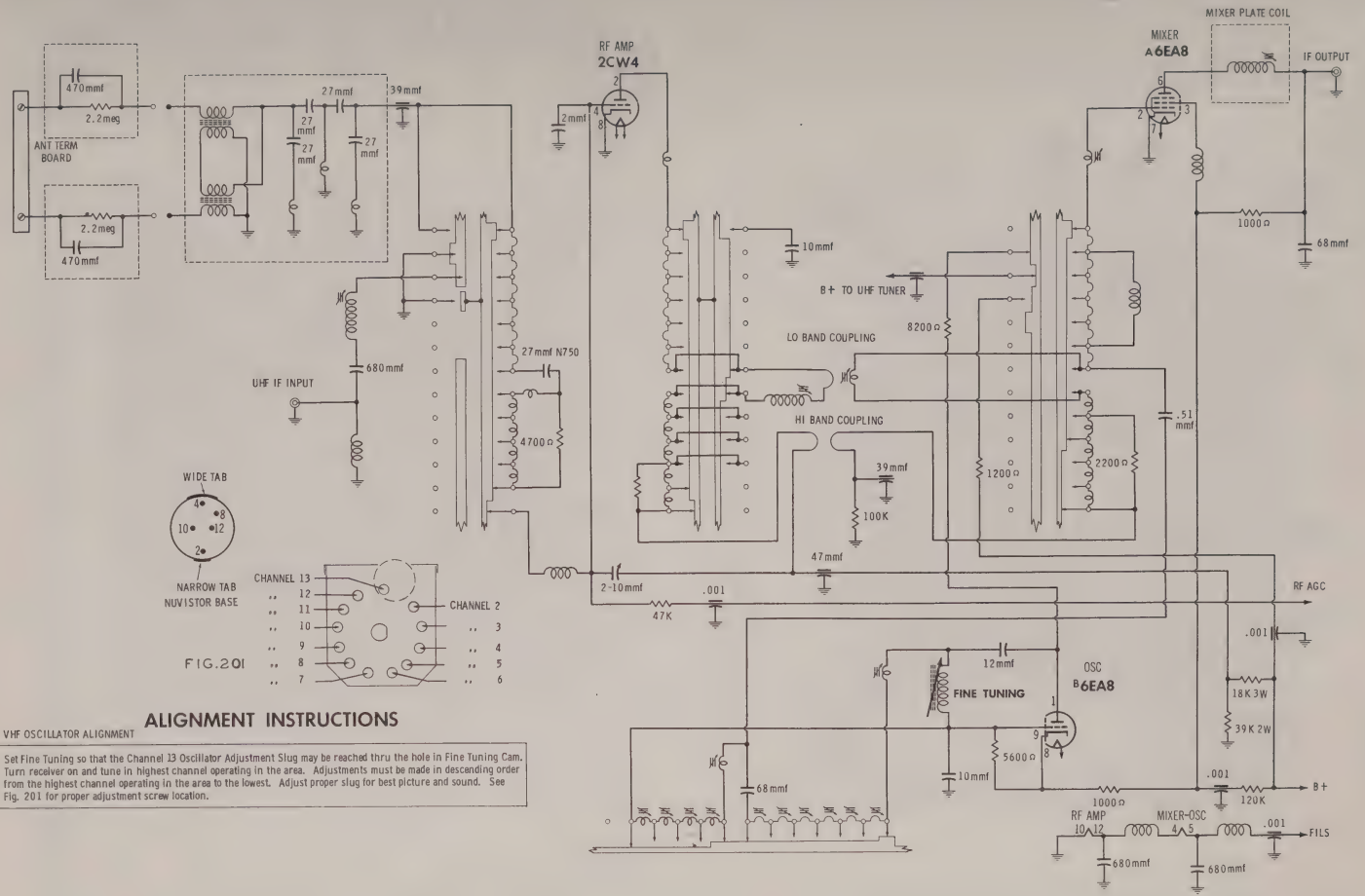

FIG. 201

ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Set Fine Tuning so that the Channel 13 Oscillator Adjustment Slug may be reached thru the hole in Fine Tuning Cam. Turn receiver on and tune in highest channel operating in the area. Adjustments must be made in descending order from the highest channel operating in the area to the lowest. Adjust proper slug for best picture and sound. See Fig. 201 for proper adjustment screw location.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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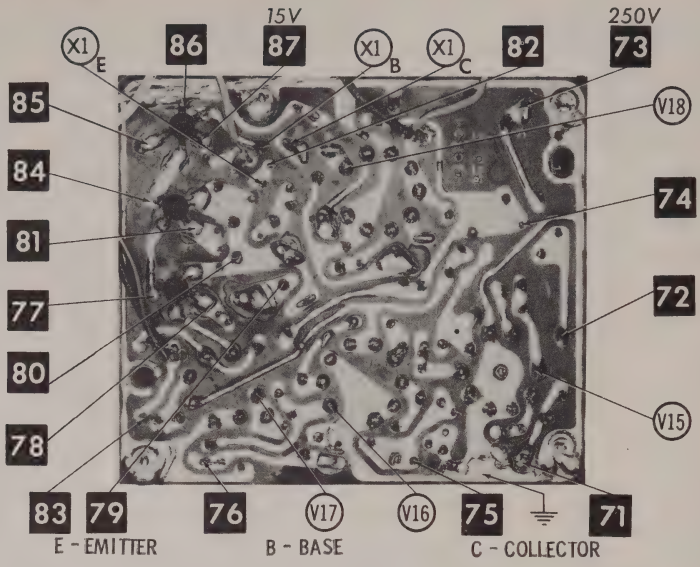
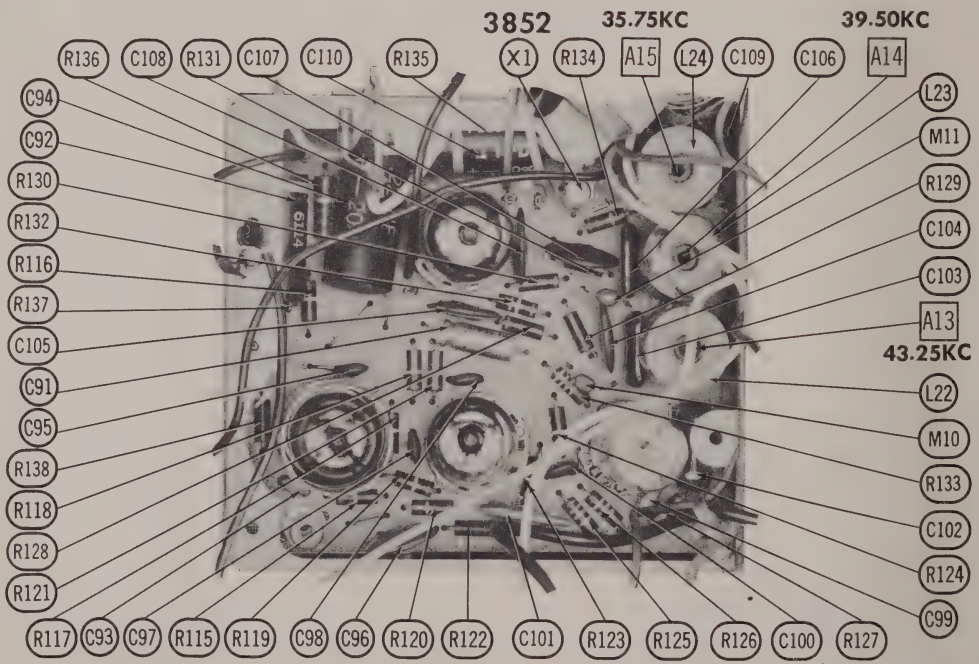
VHF TUNER WITH UHF PROVISIONS KRK104B

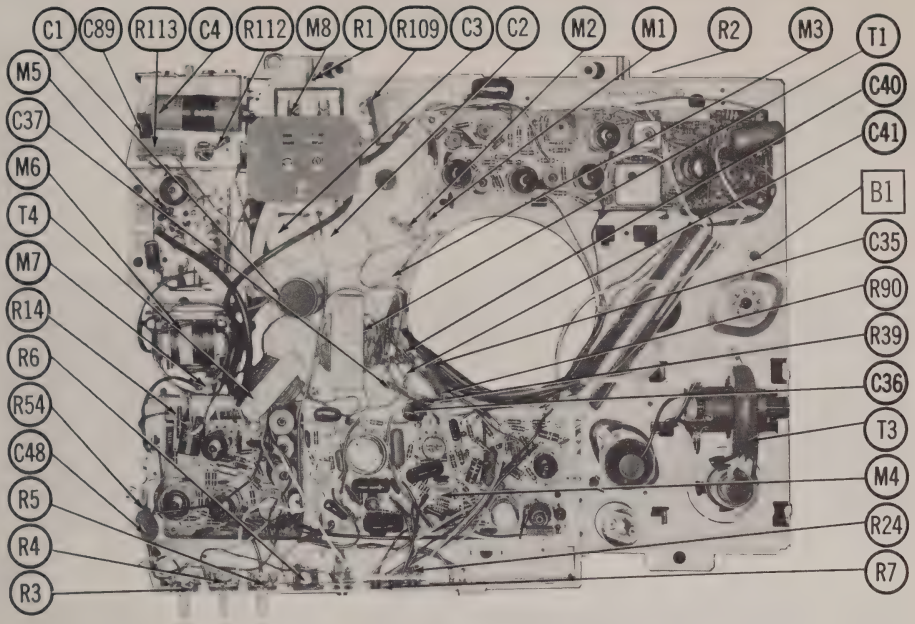
RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A



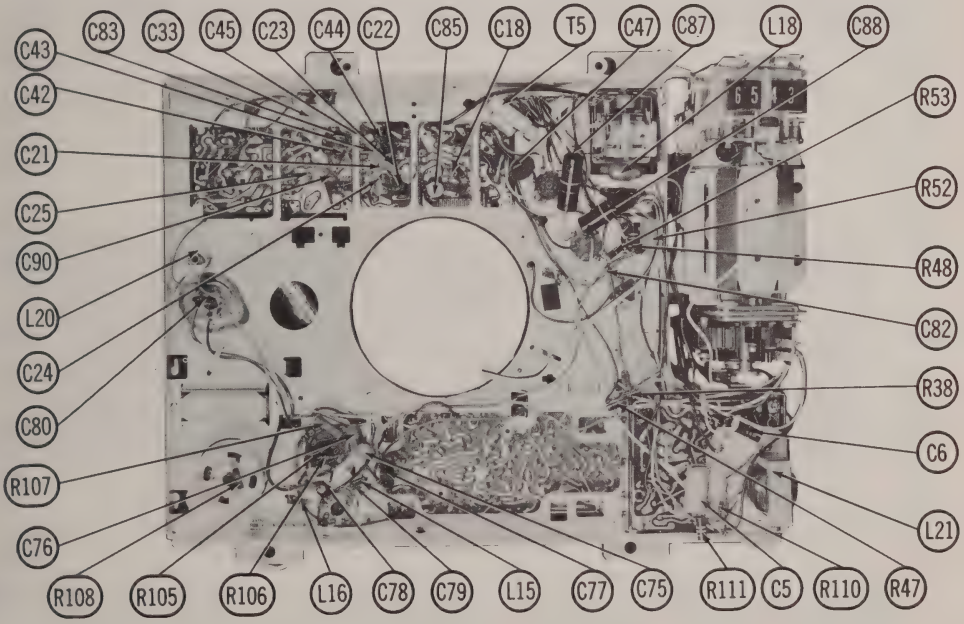
REMOTE CONTROL RECEIVER PRINTED BOARD



REMOTE CONTROL RECEIVER PRINTED BOARD

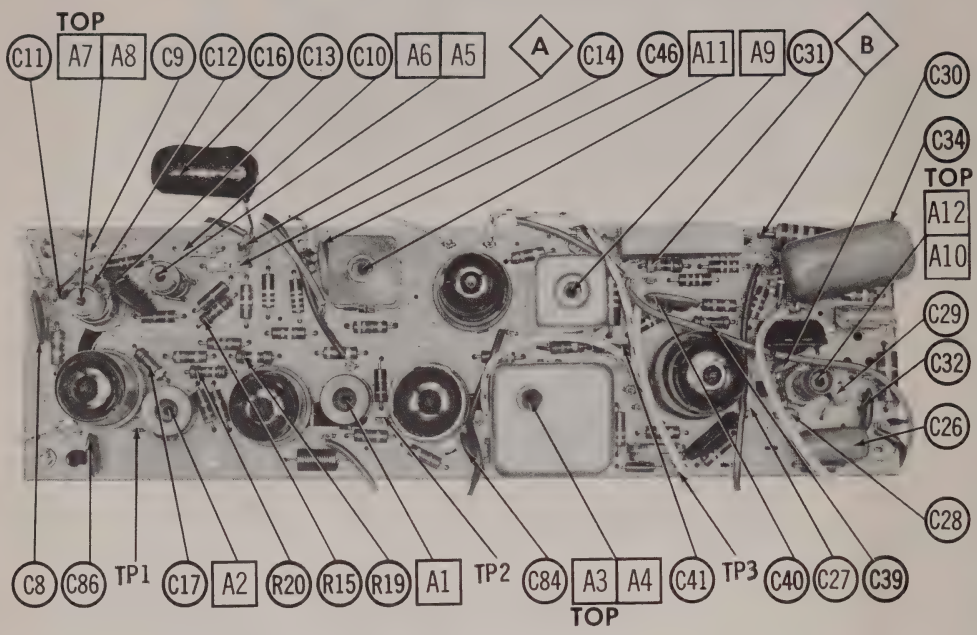


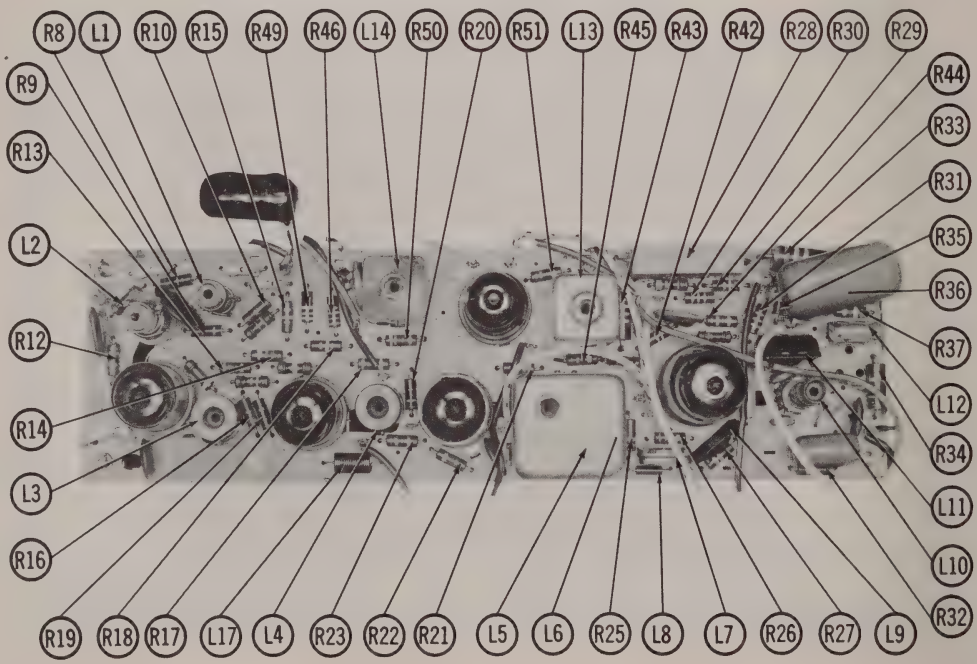
CHASSIS - REAR VIEW



CHASSIS - FRONT VIEW

TP1 105V 1ST VIDEO IF PLATE TP2 0V 3RD VIDEO IF GRID
TP3 -.6V VIDEO OUTPUT GRID





VIDEO, SOUND PRINTED BOARD

TV ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
Set Contrast Control fully clockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	High side thru .001mfd to TP-3. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru diode probe (Fig. 6) to pin 7 (grid 3) of Audio Det. Low side to chassis.	A9, A10	Adjust for maximum negative voltage on meter. Attenuate generator output for a reading between 1.0 to 1.5 volts on meter when finally peaked. Peak A9 with maximum core separation. Adjust A10 for maximum deflection.
13.	Remove VTVM and diode probe. Connect scope across Volume Control. Turn off signal generator and tune in the strongest TV station in the area and adjust Volume Control for normal volume. Preset coil slug All even with top of coil form. While observing scope and listening to sound, adjust All clockwise to a peak. Continue turning clockwise to a second louder peak and adjust for maximum on second peak.					

4.5MC TRAP ALIGNMENT

Set Contrast Control fully clockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	High side thru .01mfd to TP-3. Low side to chassis.	4.5MC (400∿ Mod.)	Any non-interfering channel	Vert. Amp. thru demodulator probe to cathode of picture tube. Low side to chassis.	A12	Adjust for MINIMUM 400∿ indication on scope.

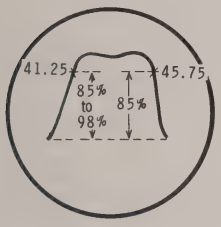


FIG.1

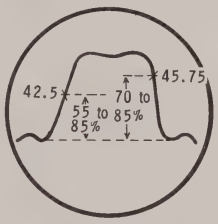


FIG. 2

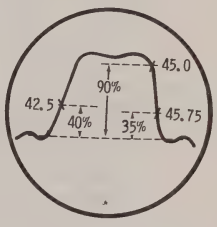


FIG.3

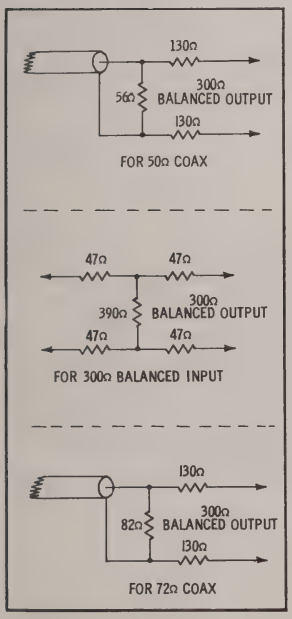


FIG. 5

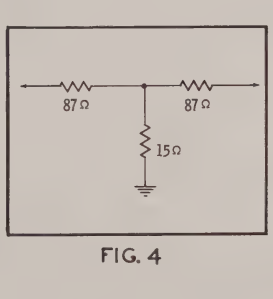


FIG. 4

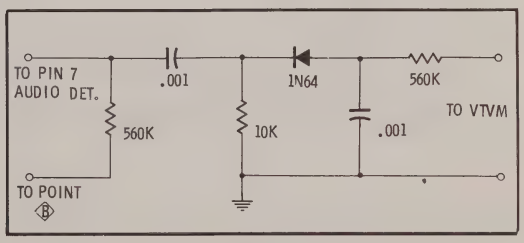


FIG. 6

RCA VICTOR CHASSIS KCS137A, KCS137B, KCS137P, KRS25A, KRT3A

FOLDER 2

RESISTANCE MEASUREMENTS

TV

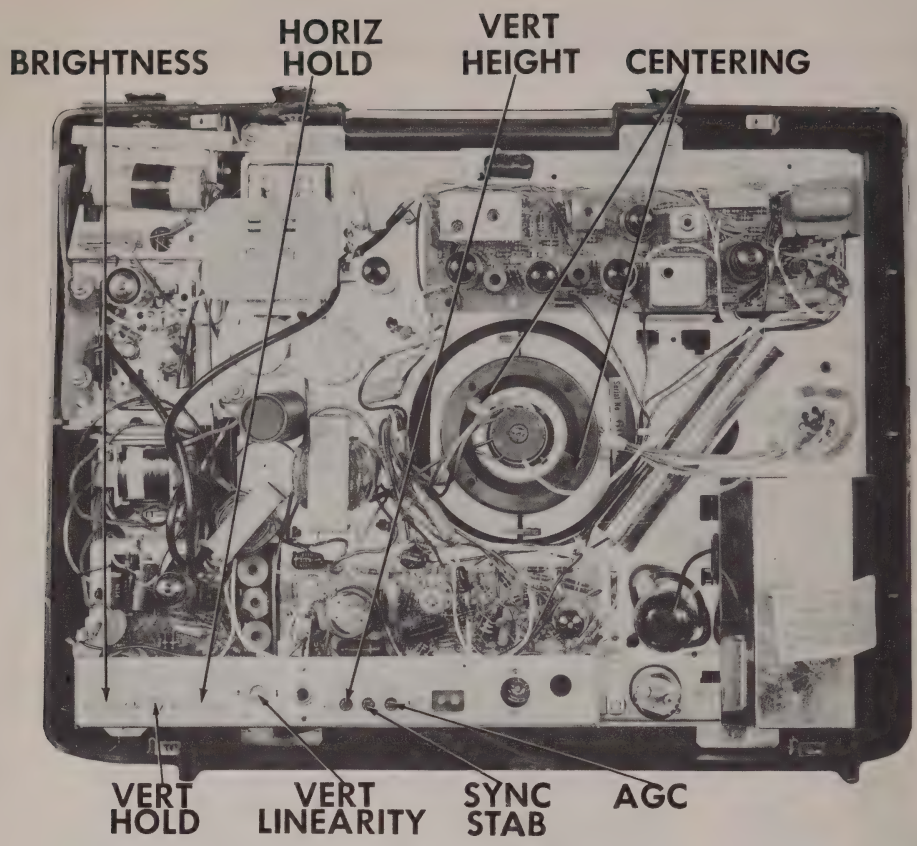
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	1.8meg	56Ω	8.5Ω	10Ω	820Ω	▲830Ω	0Ω		
V2	5GM6	15K	▲12Ω	10Ω	11.5Ω	†1900Ω	†1900Ω	100K		
V3	5EW6	.1Ω	150Ω	11.5Ω	13Ω	†5200Ω	†5200Ω	0Ω		
V4	10HF8	270Ω	100K	†47K	15.5Ω	13Ω	15Ω	3600Ω	†24K	†7000Ω
V5	6GY6	†30K	†10K	18.5Ω	17.5Ω	1.8meg	•†7000Ω	†180K		
V6	6GX6	14Ω	560Ω	15.5Ω	16.5Ω	†330K	†15K	470K		
V7	6AQ5A	NC	680Ω	17.5Ω	16.5Ω	†2600Ω	†2200Ω	0Ω		
V8	4AV6	8.5meg	0Ω	4Ω	5.5Ω	190K	190K	†40K		
V9	13EM7	• 700K	†335Ω	• 500Ω	• 700K	†2.7meg	190K	22Ω	18.5Ω	
V10	8FQ7	†50Ω	1.4meg	2200Ω	5.5Ω	8.5Ω	†80K	• 85K	70Ω	0Ω
V11	17GW6	TP	27Ω	TP	†8200Ω	950K	TP	24.5Ω	0Ω	TOP CAP †12Ω
V12	17DM4	NC	NC	¶ 8meg	NC	†50Ω	NC	22Ω	24.5Ω	
V13	1G3GT / 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †560Ω
V14	19AYP4	2.5Ω	27K	†1.8meg	0Ω	NC	NC	• 160K	4Ω	
V201	2CW4	Pin 2 †14K	Pin 4 2.5meg	Pin 8 0Ω	Pin 10 0Ω	Pin 12 .5Ω				
V202	6CG8A	4700Ω	†9800Ω	0Ω	.5Ω	2.5Ω	†6100Ω	†5100Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
¶ MEASURED FROM PIN 3 OF V12.
▲ MEASURED FROM PIN 7 OF V2.
NC NO CONNECTION TP TIE POINT

REMOTE CONTROL RECEIVER

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V15	12AX7	†100K	100K	0Ω	FIL	FIL	†100K	900K	0Ω	FIL
V16	12AX7	†100K	100K	0Ω	FIL	FIL	†100K	900K	0Ω	FIL
V17	6AV6	68K	0Ω	FIL	FIL	470K	150K	†100K		
V18	12BH7	†15K	2.1meg	0Ω	FIL	FIL	†15K	2.1meg	0Ω	FIL

† MEASURED FROM OUTPUT OF M1.
TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

CHECK OF THE HORIZONTAL OSCILLATOR ADJUSTMENT

Turn the Horizontal Hold fully clockwise. The picture should fall out of sync with approximately eight diagonal bars slanting down to the left. Turn the Hold counterclockwise slowly. The number of bars will gradually reduce and when only one and a half to three bars are obtained, the picture will pull into sync with only a slight additional counterclockwise turn of the Hold. Continue turning the Horizontal Hold counterclockwise until the picture falls out of sync. Rotation beyond fallout position should produce between 2 and 5 bars before interrupted oscillations (motorboat occurs). Interrupted oscillation should be reached before full counterclockwise rotation.

If the receiver passes this check and the picture is normal and stable, the Horizontal Oscillator is properly adjusted. Skip "Adjustment of the Horizontal Oscillator".

ADJUSTMENT OF HORIZONTAL OSCILLATOR

If in the above check the receiver failed to hold sync over two thirds turn of counterclockwise rotation of the Horizontal Hold from pull-in point, it will be necessary to make the following adjustments.

The Width Slug should be properly adjusted before attempting to adjust the Stabilizing Coil.

Set the Horizontal Stabilizing Coil Slug (B2) fully clockwise.

Adjustment of the Horizontal Hold in the counterclockwise direction will show a multiple number of bars before "motorboat" occurs. Adjust B2 until 3 bars are present before "motorboat" occurs, when the Horizontal Hold is rotated counterclockwise from the fallout point.

WIDTH ADJUSTMENT

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Width Slug (B1) to fill the picture mask with a line voltage of 105 volts. With normal line voltage of 117 volts, adjust B1 for an overscan of approximately $\frac{1}{2}$ inch on each side of the screen. This adjustment should be made with the Brightness Control set at normal level.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 192A072RS

1. Remove 3 push-on type knobs on top of cabinet.
2. Remove rear cover (6 screws).
3. Remove 4 chassis mounting nuts and 2 chassis mounting bolts.
4. Disconnect yoke plug, picture tube socket, remote control receiver lead, speaker leads and high voltage lead.
5. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder

**ADMIRAL MODEL
Y2137 (Ch.8C2)**

ADMIRAL MODEL
Y2137 (Ch.8C2)

ADMIRAL MODEL
Y2137 (Ch.8C2)

TRADE NAME	Admiral Model Y2137 (Ch. 8C2)
MANUFACTURER	Admiral Sales Corp., National Service Div., 903 Morrissey Drive, Bloomington, Illinois
TYPE SET	Battery Operated Transistorized BC-SW-LW Portable Receiver
POWER SUPPLY	9 Volts DC RATING 10MA @ 9 Volts DC (No Signal, Min. Volume) 20MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGES—BROADCAST	535—1620KC SHORT WAVE 1.9—5.2MC LONG WAVE 140—420KC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF879

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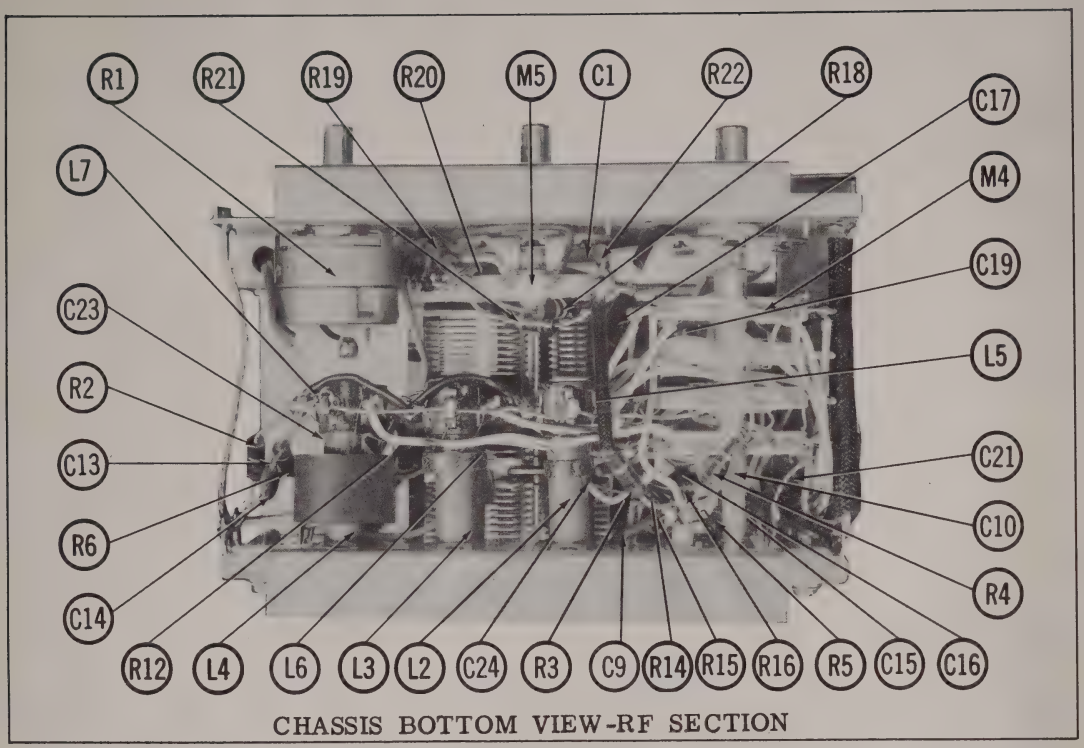
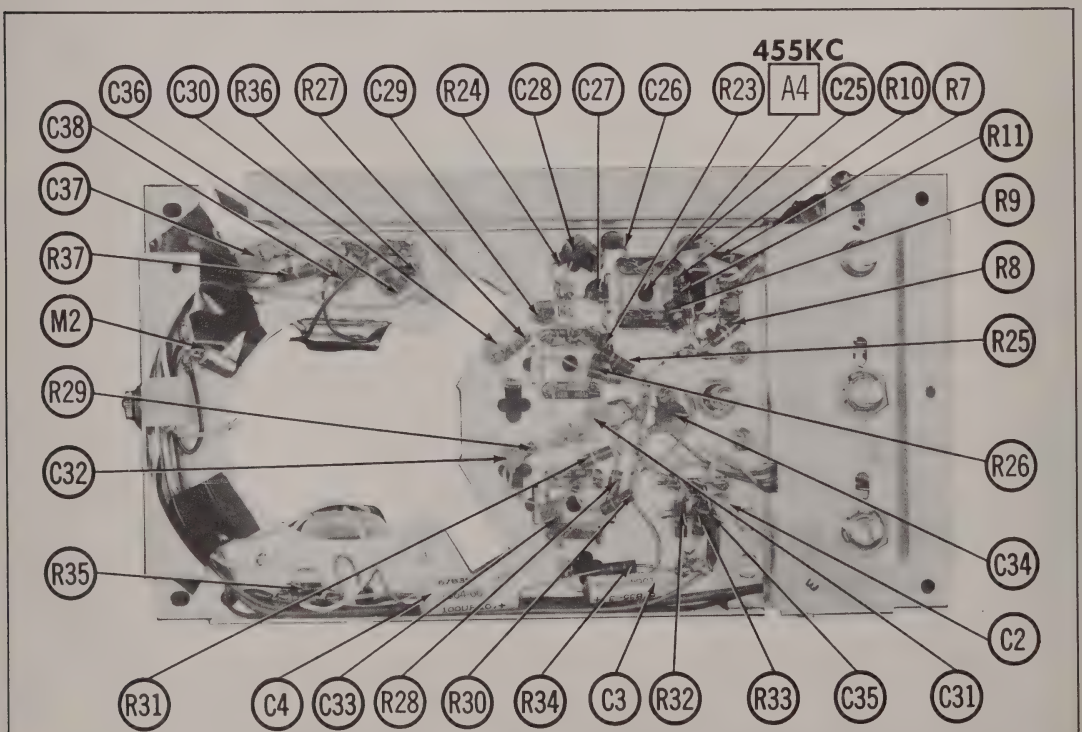
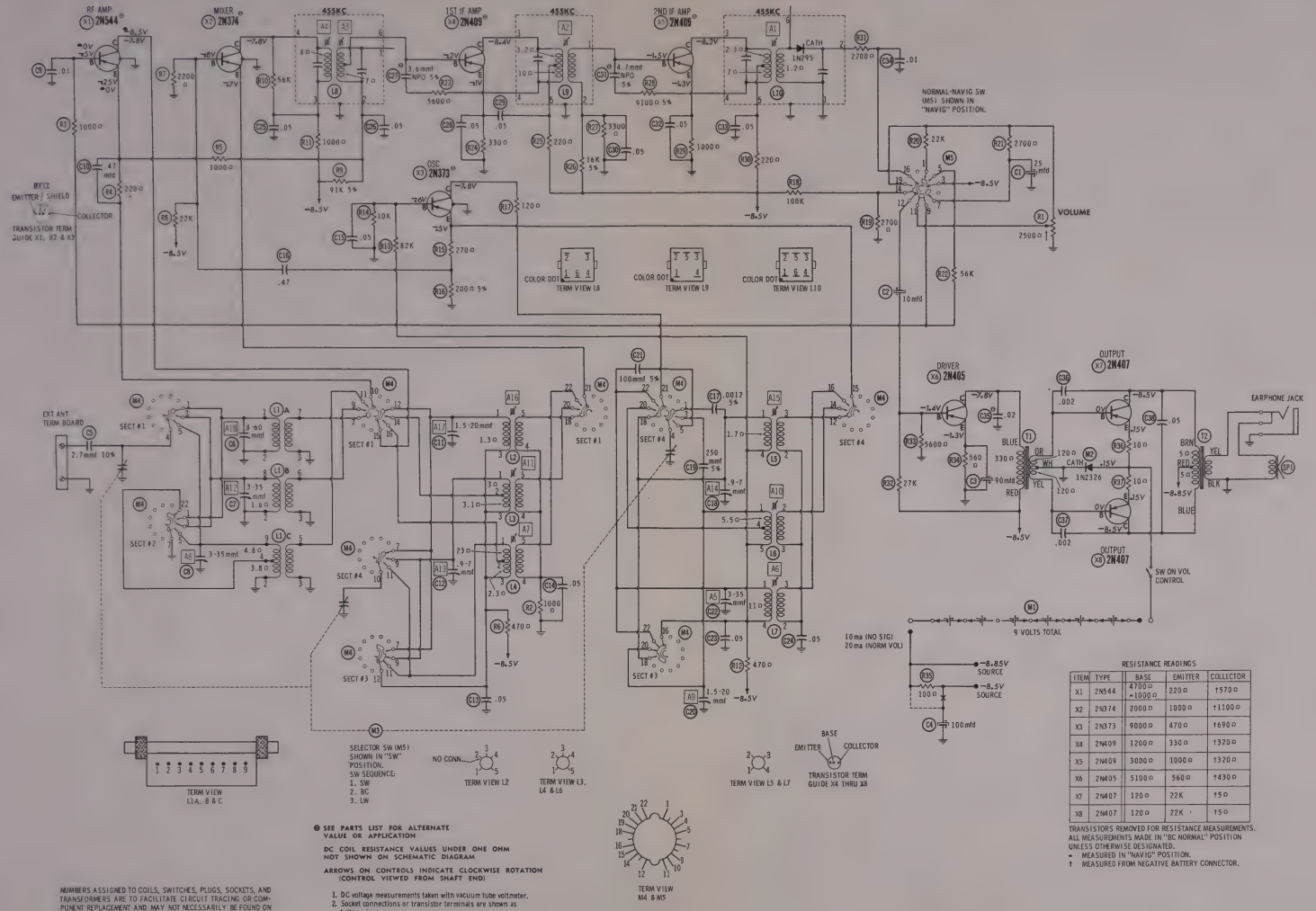


CHASSIS BOTTOM VIEW-RF SECTION



CHASSIS BOTTOM VIEW-IF AUDIO SECTION



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N544	4700Ω +1000Ω	220Ω	↑570Ω
X2	2N374	2000Ω	1000Ω	↑1100Ω
X3	2N373	9000Ω	470Ω	↑690Ω
X4	2N409	1200Ω	330Ω	↑320Ω
X5	2N409	3000Ω	1000Ω	↑320Ω
X6	2N405	5100Ω	560Ω	↑430Ω
X7	2N407	120Ω	22K	↑5Ω
X8	2N407	120Ω	22K	↑5Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
ALL MEASUREMENTS MADE IN "BC NORMAL" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "NAVIG" POSITION.
↑ MEASURED FROM NEGATIVE BATTERY CONNECTOR.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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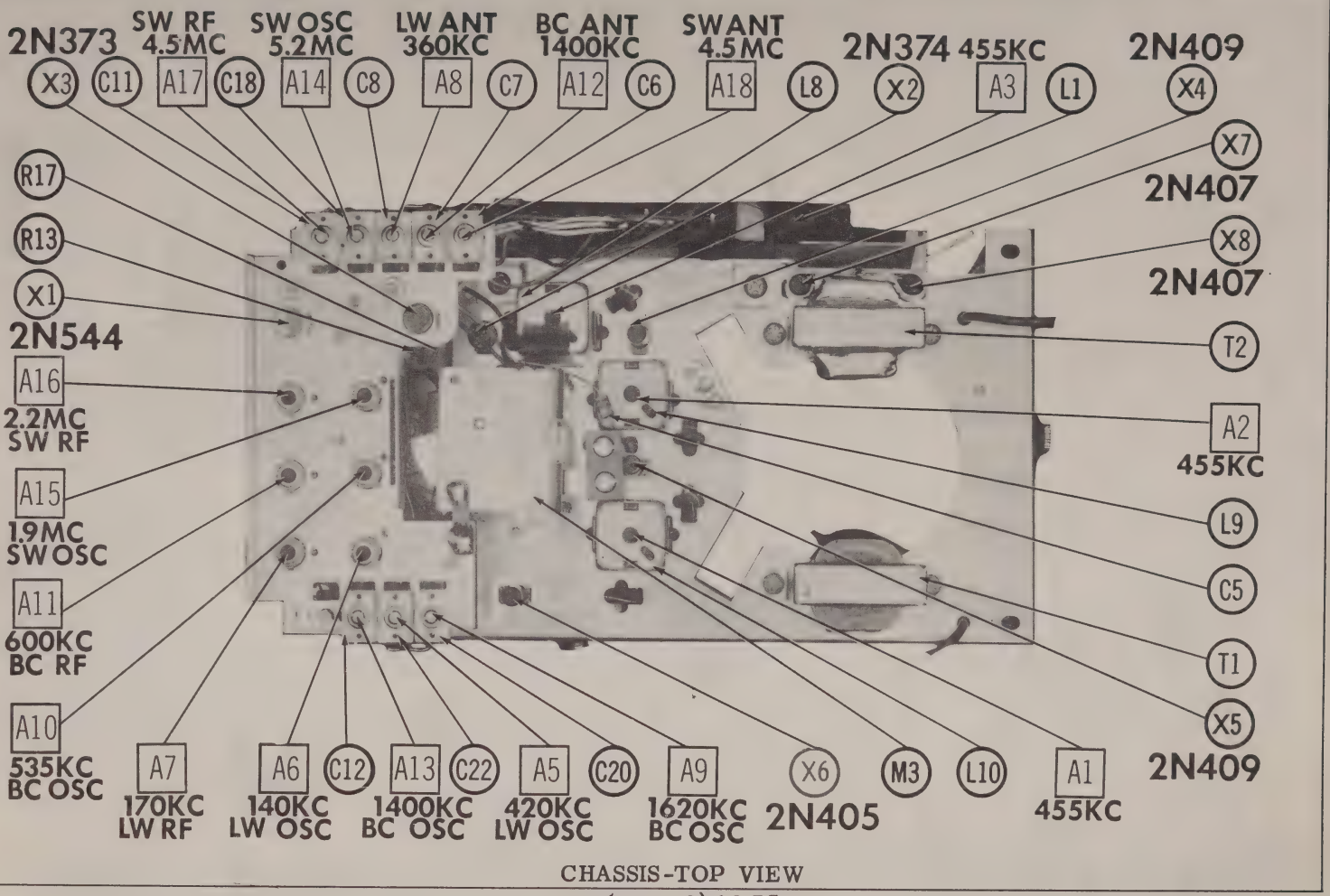
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

ADMIRAL MODEL Y2137 (Ch.8C2)



CHASSIS-TOP VIEW

ADMIRAL MODEL
Y2137 (Ch. 8C2)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A8, A9, A12, A13, A14, A17, A18	GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089 WALSCO #2512, 2525, 2528
A6, A7, A10, A11, A15, A16	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to Emitter of Mixer. Low side to common.	455KC (400% Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	420KC	(LW) Tuning gang fully open.	"	A5	"
3.	"	140KC	Tuning gang fully closed.	"	A6	"
4.	"	170KC	170KC	"	A7	"
5.	"	360KC	360KC	"	A8	"
6.	"	1620KC	(BC) Tuning gang fully open.	"	A9	"
7.	"	535KC	Tuning gang fully closed.	"	A10	"
8.	"	600KC	600KC	"	A11	"
9.	"	1400KC	1400KC	"	A12, A13	Adjust for maximum output while rocking tuning gang.
10.	"	5.2MC	(SW) Tuning gang fully open.	"	A14	Adjust for maximum output.
11.	"	1.9MC	1.9MC	"	A15	"
12.	"	2.2MC	2.2MC	"	A16	"
13.	"	4.5MC	4.5MC	"	A17, A18	Adjust for maximum output. Repeat Steps 2 thru 13.

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2N544	RF Amplifier	2N544		PNP
	2N1631*	RF Amplifier			
X2	2N374	Mixer	2N374		PNP
	2N1527*	Mixer			
X3	2N373	Oscillator	2N373		PNP
	2N1633*	Oscillator			
X4	2N409	1st IF Amplifier	2N410	2N483	PNP
	2N1525*	1st IF Amplifier			
X5	2N409	2nd IF Amplifier	2N410	2N483	PNP
	2N1525*	2nd IF Amplifier			
X6	2N405	Driver	2N406	2N631	PNP
X7	2N407	Output	2N217	2N631	PNP
X8	2N407	Output	2N217	2N631	PNP

* Type used in Run 12.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	25	3	67B35-8	PTT9	NLW25-3	MT1-10	TT3X25	MLV25-3	TE-1055
C2	10	3	67B35-6	PTT6	NLW10-6	MT1-5	TT3X10	MLV10-3	TE-1053
C3	90	3	67B35-3	PTT13	NLW100-3	MT1-18	TT6X100	MLV100-3	TE-1059.5
C4	100	10	67B35-9	PTT46	NLW100-12	MT1-19	TT15X100	MLV100-10	TE-1119.3

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	2.7 10%		NPO-SI 3.0		C10V3C			10TCC-V27
C6	8-60	#66A7-9				404		
C7	3-35	#66A7-6				403		
C8	3-35	#66A7-6				403		
C9	.01		BPD-01	DDM-103	H-05S1	CCD-103	TA-110	TG-S10
C10	.47mfd 3V			UK-474				HY-130
C11	1.5-20	#66A7-5				402		
C12	.9-7	#66A7-4				400		
C13	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C14	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C15	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C16	.47 3V			UK-474				HY-130
C17	.0012 5%		1464-0012		5R5D12	CM-19B-122J 400	MCJ455	MS-212
C18	.9-7	#66A7-4						
C19	250 5%		1469-00025		22R5T25	CM-19B-251J 402	MCE240	MS-325
C20	1.5-20	#66A7-5						
C21	100 5%		1469-0001	TCZ-100	22R5T1	CM-19B-101J 403	MCE235	MS-31
C22	3-35	#66A7-6						
C23	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C24	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C25	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C26	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C27	3.6 NPO 5%	Note 1	NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C28	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C29	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C30	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C31	4.7 NPO 5%	Note 1	NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C32	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C33	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C34	.01 50V		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C35	.02	Note 2	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C36	.002 10V		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C37	.002 10V		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C38	.05 10V		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50

Note 1. Not used in Run 12 Versions.
Note 2. Some versions may use .05mfd in this application.
Admiral Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2500Ω	½	75D1-129	B-702	A47-2500-S	Q13-111	U8	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	1000Ω				R20	22K			
R3	1000Ω				R21	2700Ω			
R4	220Ω				R22	56K			
R5	1000Ω				R23	5600Ω			
R6	470Ω				R24	330Ω			
R7	2200Ω				R25	220Ω			
R8	22K				R26	16K 5%			
R9	91K 5%				R27	3300Ω			
R10	56K				R28	9100Ω 5%			
R11	1000Ω				R29	1000Ω			
R12	470Ω				R30	220Ω			
R13	82K				R31	2200Ω			
R14	10K				R32	27K			
R15	470Ω				R33	5600Ω			
R16	200Ω 5%				R34	560Ω			
R17	120Ω				R35	100Ω			
R18	100K				R36	10Ω			
R19	2700Ω				R37	10Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ADMIRAL PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1A	SW Loopstick	69C261-1 ①					① Includes Complete Ass'y.
B	BC Loopstick						
C	LW Loopstick						
L2	SW RF	69C253-3					
L3	BC RF	69C253-2					
L4	LW RF	69C253-1					
L5	SW Osc.	69C253-6					
L6	BC Osc.	69C253-5					
L7	LW Osc.	69C253-4					
L8	1st IF	72C189-7					
L9	2nd IF	72C190-11					
L10	3rd IF	72C190-12					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ADMIRAL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	79B67-4					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ADMIRAL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	3-4Ω	79D33-30		TA-42 ①	TR-114 ①		① Drill New Mounting Hole(s).

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78C169-2	4A07	

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			130		635		M-14R	6 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M2	1N2326	57C1-29			Output bias regulation

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuning Cap.	68C81-1	3 Gang
M4	Switch	77C111-1	Band Selector (Rotary Type)
M5	Switch	77C112-1	Norm.-Navig. (Rotary Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Crystal	24B36-1	
Dial Scale	21C133-1	
Dial Pointer	25B70-3	
Knob	20C41-1	Tuning
Knob	20C41-2	Volume, Band Selector, Norm.-Navig.
Cabinet	A7771	Tan

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder

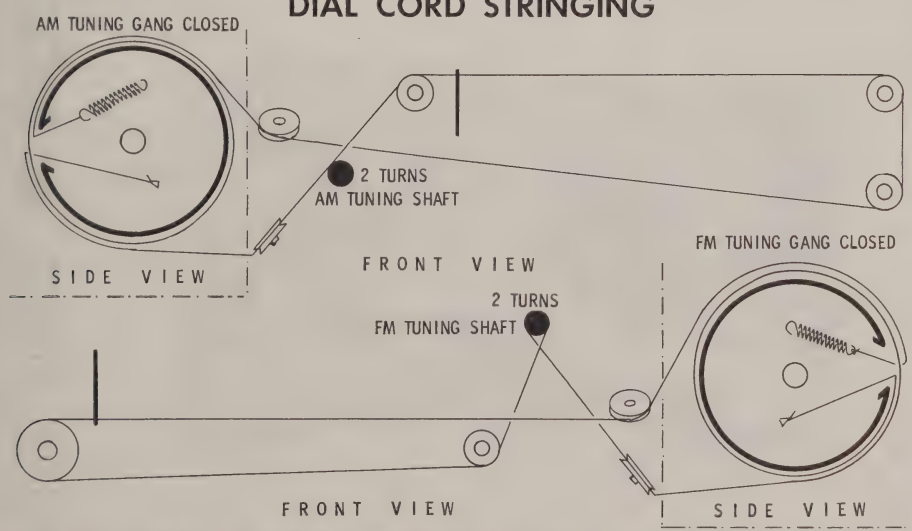
BOGEN MODEL TP-40

BOGEN MODEL TP-40

BOGEN MODEL TP-40

TRADE NAME	Bogen Model TP-40
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 13 Tube FM-AM Tuner
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 60 Watts, .55 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1600KC FREQ. MOD. 88 – 108 MC

DIAL CORD STRINGING



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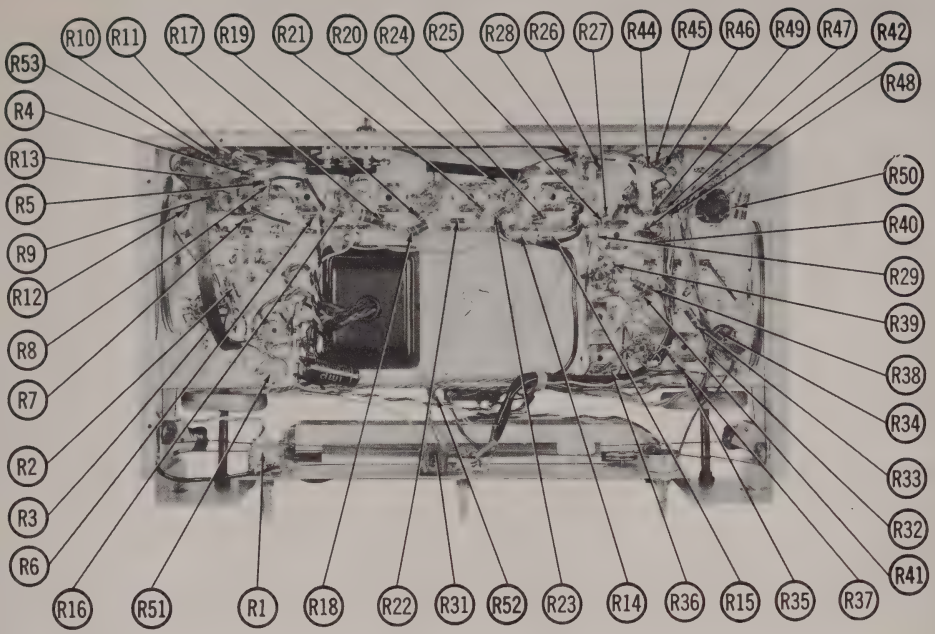
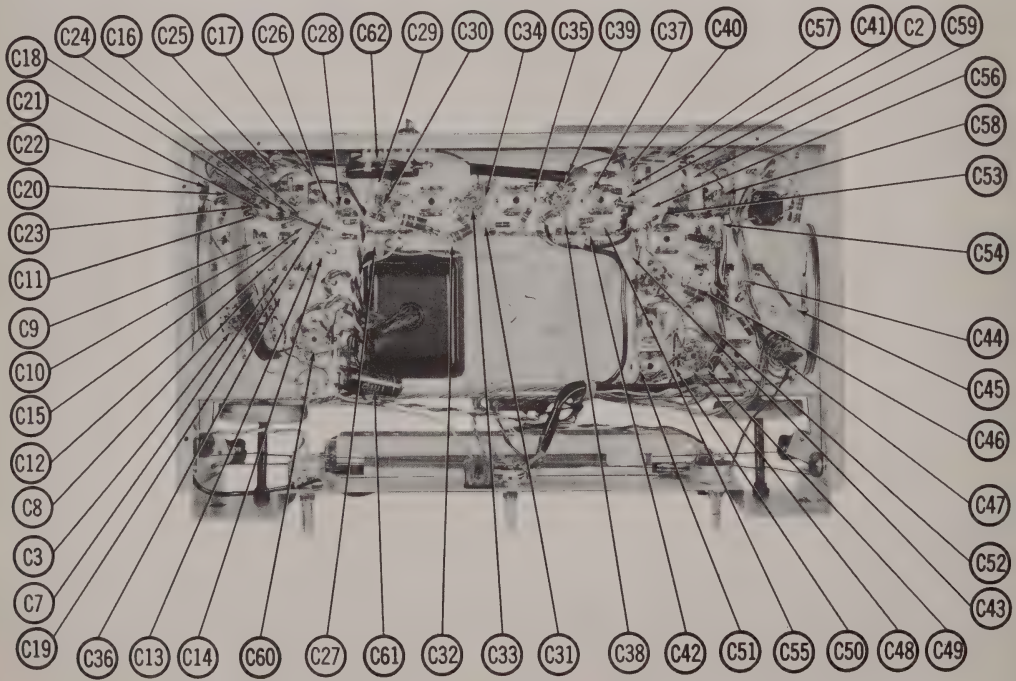
KL997

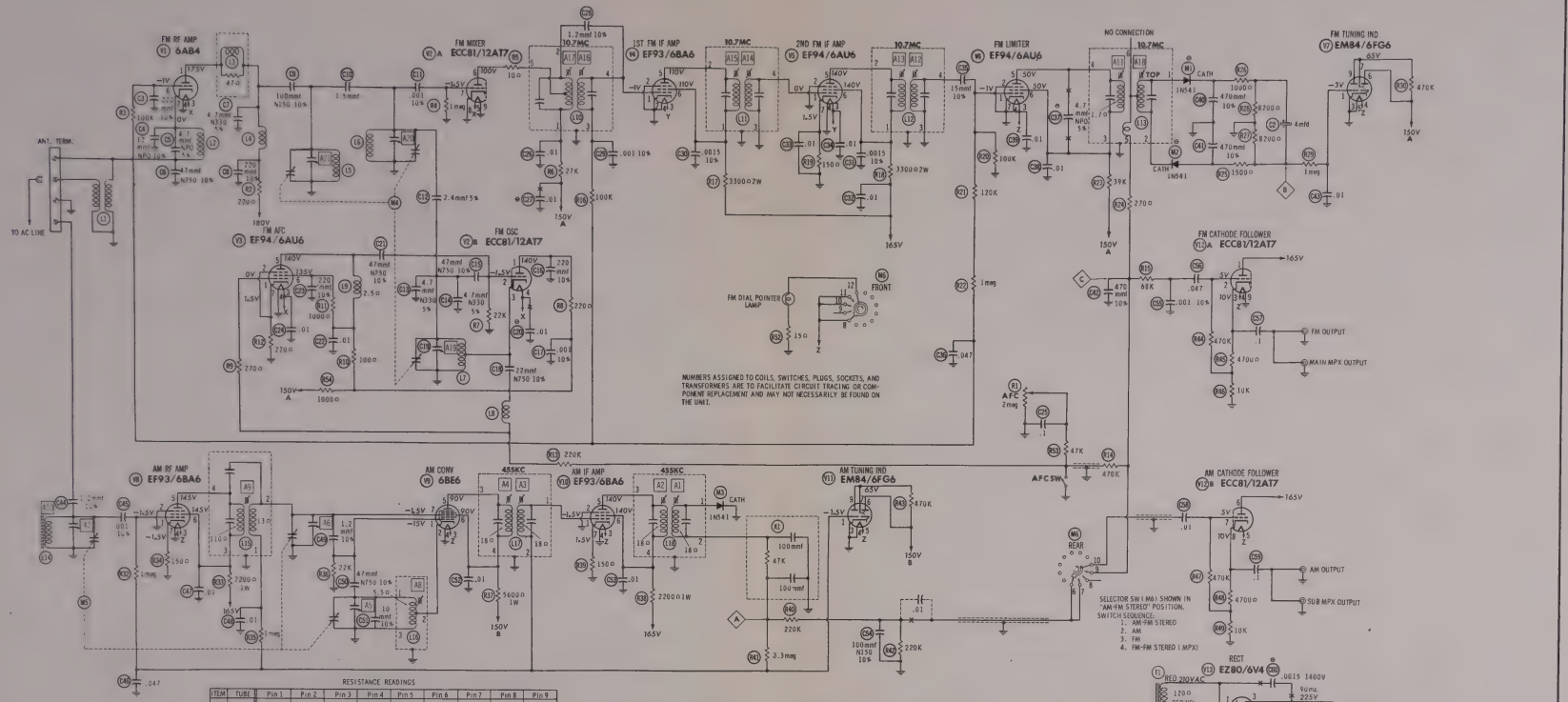
SET 559 FOLDER 4



CHASSIS BOTTOM VIEW-RESISTOR IDENT.



CHASSIS BOTTOM VIEW-CAPACITOR IDENT.


FM RF AMP V1 6AB4
FM MIXER V2A ECC81/12AT7
1ST FM IF AMP V4 EF93/6BA6
2ND FM IF AMP V5 EF94/6AU6
FM LIMITER V6 EF94/6AU6
FM TUNING IND V7 EM84/6FG6
FM AFC V3 EF94/6AU6
FM OSC V2B ECC81/12AT7
FM CATHODE FOLLOWER V12A ECC81/12AT7
AM RF AMP V8 6BA6
AM CONV V9 6BE6
AM IF AMP V10 EF93/6BA6
AM TUNING IND V11 EM84/6FG6
AM CATHODE FOLLOWER V12B ECC81/12AT7
RECT V13 EZ80/6V4
10.7MC
455KC
ANT. TERM.
TO AC LINE
FM DIAL POINTER LAMP
FM OUTPUT
MAIN MPX OUTPUT
AM OUTPUT
SUB MPX OUTPUT
AFC SW
SELECTOR SW (M6) SHOWN IN "AM-FM STEREO" POSITION.
SWITCH SEQUENCE:
1. AM-FM STEREO
2. AM
3. FM
4. FM-FM STEREO (MPX)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
L10 TERMINAL GUIDE
L11 & L12 TERMINAL GUIDE
L16 TERMINAL GUIDE
L15, L17 & L18 TERMINAL GUIDE
L13 TERMINAL GUIDE
TO ANT. TERM.
AC RECEPT
117VAC - 60 WATTS
RED 210VAC
180V SOURCE
165V SOURCE
150V B SOURCE
150V A SOURCE
REAR
TUBE LAYOUT (BOTTOM VIEW)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AB4	†720Ω	0Ω	FIL	FIL	0Ω	1.3meg	.1Ω		
V2	ECC81 12AT7	†2700Ω	22K	.1Ω	FIL	FIL	†28K	1meg	0Ω	FIL
V3	EF94 6AU6	220K ■600K	220Ω	FIL	FIL	†2600Ω	†3600Ω	220Ω		
V4	EF93 6BA6	1.3meg	0Ω	FIL	FIL	†4100Ω	†4100Ω	0Ω		
V5	EF94 6AU6	.1Ω	0Ω	FIL	FIL	†4100Ω	†4100Ω	150Ω		
V6	EF94 6AU6	100K	0Ω	FIL	FIL	†40K	†40K	0Ω		
V7	EM84 6FG6	1meg	NC	0Ω	FIL	FIL	†1500Ω	†470K	NC	†470K
V8	EF93 6BA6	4.3meg	0Ω	FIL	FIL	†3000Ω	†3000Ω	150Ω		
V9	6BE6	22K	.1Ω	FIL	FIL	†7100Ω	†7100Ω	4.3meg		
V10	EF93 6BA6	3.3meg	0Ω	FIL	FIL	†3000Ω	†3000Ω	150Ω		
V11	EM84 6FG6	3.3meg	NC	0Ω	FIL	FIL	†1500Ω	†470K	NC	†470K
V12	ECC81 12AT7	†770Ω	480K	15K	FIL	FIL	†770Ω	480K	15K	FIL
V13	EZ80 6V4	120Ω	NC	¶ INF.	FIL	FIL	NC	110Ω	NC	NC

ALL MEASUREMENTS MADE IN "FM-FM STEREO" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC INT THE CIRCUIT.
† MEASURED FROM PIN 3 OF V13.
■ MEASURED WITH AFC ON, SET TO MAXIMUM.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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BOGEN MODEL TP-40

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
"AFC" Off.
Suggested Alignment Tools: A1 thru A4, A8, A9, A11 thru A18.... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7, A20, A21.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A19.....GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ 30% AM)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	High side to AM antenna terminal. Low side to chassis.	600KC	600KC	"	A5, A6, A7	Adjust for maximum deflection. Adjust A7 by moving coil turns along ferrite core.
3.	"	1400KC	1400KC	"	A8, A9, A10	Adjust for maximum deflection. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A11, A12, A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
5.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	104MC (Unmod.)	(FM) 104MC	DC probe to point Ⓑ. Common to chassis.	A19, A20, A21	Adjust for maximum deflection.
7.	"	90MC	90MC	"	L7, L6, L5	Adjust by expanding or compressing coil turns for maximum deflection. Repeat steps 6 and 7.

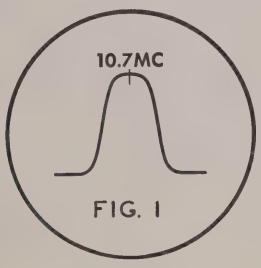


FIG. 1

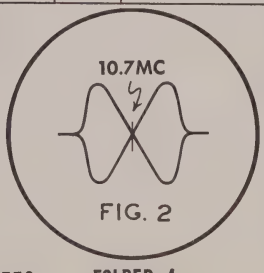
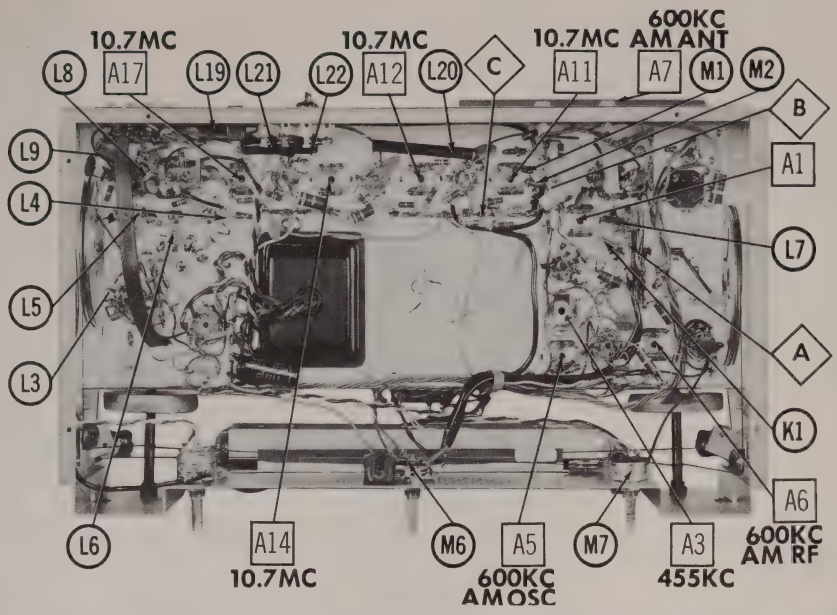


FIG. 2

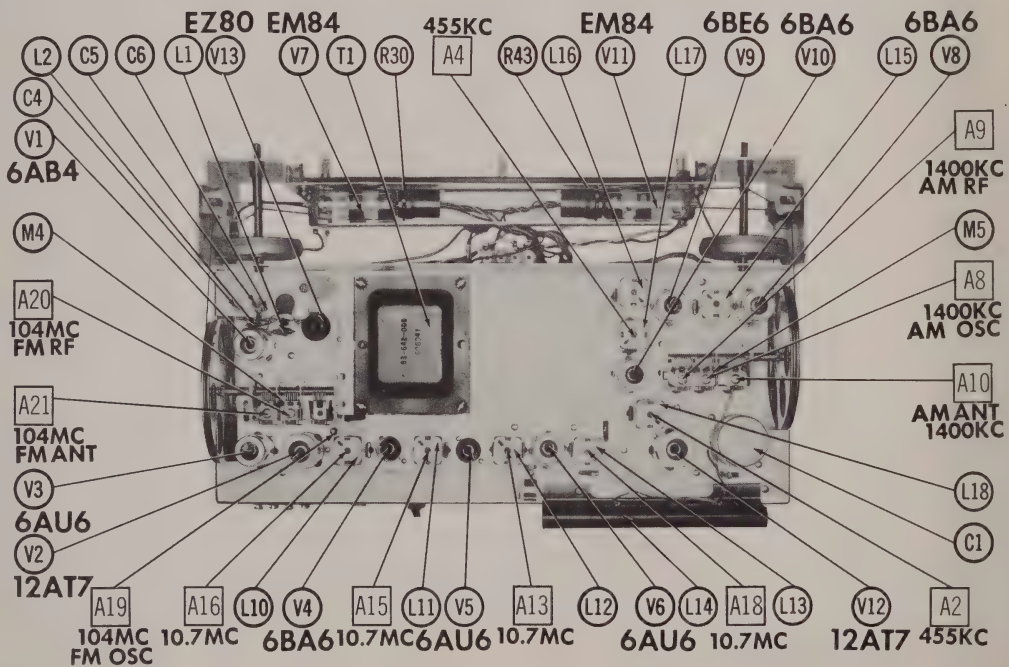
SET 559 FOLDER 4

BOGEN MODEL TP-40

FOLDER 4



CHASSIS BOTTOM VIEW-ALIGN., INDUCTOR & MISC. IDENT.



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	FM RF Amplifier	6AB4
V2	FM Mixer-FM Osc.	ECC81/12AT7
V3	FM AFC	EF94/6AU6
V4	1st FM IF Amplifier	EF93/6BA6
V5	2nd FM IF Amplifier	EF94/6AU6
V6	FM Limiter	EF94/6AU6
V7	FM Tuning Indicator	EM84/6FG6
V8	AM RF Amplifier	EF93/6BA6
V9	AM Converter	6BE6
V10	AM IF Amplifier	EF93/6BA6
V11	AM Tuning Indicator	EM84/6FG6
V12	FM Cathode Follower-AM Cathode Follower	ECC81/12AT7
V13	Rectifier	EZ80/6V4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲20	250	98-010-023	AFH3-36	D0032	XC4-49	FP420.35	TMQ-4616	TVL-4763
B	■20	250		PRS1570					
C	▲20	250							
D	20	250							
C2	4	25	80-2004-01	PTT77	NLW4-50	MT1-3	TT50X4	TD-4-25	TE-1201.2

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C4	12 NPO 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C5	4.7 NPO 5%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C6	47 N750 10%		N750-DI 47	DTN-47	C10Q47U		CN7-447	10TCU-Q47
C7	4.7 N330 5%					*		
C8	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C9	100 N150 10%					*		10TCP-T10
C10	1.5		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C11	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C12	2.4 5%			TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C13	4.7 N330 5%					*		
C14	4.7 N330 5%					*		
C15	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C16	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C17	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C18	22 N750 10%		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C19		#80-004-045						
C20	.01	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	.1 100V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C26	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	.01	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	1.2 10%		NPO-SI 1.0	TCZ-1	C10V15C		CNO-510	10TCC-V12
C29	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C30	.0015 10%		DI-1500	DD-152	5R5D15	CCD-152	GP215	10TS-D15
C31	.0015 10%		DI-1500	DD-152	5R5D15	CCD-152	GP215	10TS-D15
C32	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	15 10%		DI-15	DD-150	L10Q15	CCD-150	GP415	10TS-Q15
C36	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C37	4.7 NPO 5%	Note 1	NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C38	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C40	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C41	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C42	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C43	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	1.2 10%		NPO-SI 1.0	TCZ-1	C10V15C		CNO-510	10TCC-V12

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C45	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C46	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C47	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	1.2 10%		NPO-SI 1.0	TCZ-1	C10V15C		CNO-510	10TCC-V12
C50	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C51	10 10%		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C52	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	100 N150 10%					*		10TCP-T10
C55	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C56	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C57	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C58	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C59	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C60	.0015 1400V	Note 1	HVD-15-1500	DD30-152	HVC16D15	16DP-2-152	2HV-215	30GA-D15
C61	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C62	15 2000V		HVD-30-15	DD30-15	HVA20Q15	3CCD-150	2DY-415	30GA-Q15

Note 1. Not used in some versions.
Bogen Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	77-001-499	B-75	A47-2meg-S	Q11-139	U56	AFC
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	AFC Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	220Ω			
R3	100K			
R4	1meg			
R5	10Ω			
R6	27K			
R7	22K			
R8	220Ω			
R9	270Ω			
R10	100Ω			
R11	1000Ω			
R12	220Ω			
R13	220K			
R14	470K			
R15	68K			
R16	100K			
R17	3300Ω 2W			
R18	3300Ω 2W			
R19	150Ω			
R20	100K			
R21	120K			
R22	1meg			
R23	39K			
R24	270Ω			
R25	1500Ω			
R26	1000Ω			
R27	8200Ω			
R28	8200Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R29	1meg			
R30	470K			
R31	1000Ω 1W			
R32	1meg			
R33	2200Ω 1W			
R34	150Ω			
R35	1meg			
R36	22K			
R37	5600Ω 1W			
R38	2200Ω 1W			
R39	150Ω			
R40	220K			
R41	3.3meg			
R42	220K			
R43	470K			
R44	470K			
R45	4700Ω			
R46	10K			
R47	470K			
R48	4700Ω			
R49	10K			
R50	270Ω 2W			
R51A	500Ω 15W			#76-508-001
B	1000Ω 15W			
R52	15Ω			
R53	47K			
R54	1000Ω			

Bogen Part Number.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BOGEN PART No.	REPLACEMENT DATA
K1	AM Diode RF Filter	100mmf, 100mmf, 47K	78-907-001	Aerovox PA-97 Centralab PC-50 Sprague D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BOGEN PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	FM Ant.	95-5017-01					① Wound on 47Ω
L2	RF Choke (1uh)	95-5016-01	BC-561	4602	RTC-8515	T855	
L3	RF Choke	95-5001-01 ①					② IRC Part #CLA
L4	RF Choke (1.7uh)	95-5015-01	BC-562	4604	RTC-8516	T856	
L5	FM RF	95-0006-01					
L6	FM Mixer	95-0006-02					
L7	FM Osc.	95-0006-03					
L8	RF Choke (1uh)	95-5018-01	BC-561	4602	RTC-8515	T855	
L9	RF Choke (3.3uh)	95-5019-02 ②	BC-564	9330-12	RTC-8518	T816	
L10	1st FM IF	95-5011-01					
L11	2nd FM IF	95-5010-01	FM-254	1463	RTC-8599	T633	
L12	3rd FM IF	95-5010-01	FM-254	1463	RTC-8599	T633	
L13	Ratio Detector	95-5012-01	FM-255	1465	RTC-8600	T635	
L14	Loopstick	95-5022-01	BC-419	705-A		T532	
L15	AM RF	95-5032-01					
L16	AM Osc.	95-5009-01	BC-392	A-123-C	RTC-8767	T508	
L17	1st AM IF	95-5013-01	BC-352	12-C1	RTC-8633	T607	
L18	2nd AM IF	95-5013-01	BC-353	12-C2	RTC-8633	T608	
L19	Fil. Choke(1.5uh)	95-5005-02	BC-562	4604	RTC-8516	T856	
L20	Fil. Choke(1.5uh)	95-5005-02	BC-562	4604	RTC-8516	T856	
L21	Line Choke(1.7uh)	95-5015-01	BC-562	4604	RTC-8516	T856	
L22	Line Choke(1.7uh)	95-5015-01	BC-562	4604	RTC-8516	T856	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	BOGEN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .55A	420VCT @ .090A DC	6.3V @ 4.9A	83-642-000					

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		BOGEN PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M1	1N541	96-5007-02		1N295	Ratio Detector (Matched Pair)
M2	1N541	96-5007-02		1N295	Alternate Part #96-5007-01 (1N542)
M3	1N541	96-5007-02		1N295	AM Detector

MISCELLANEOUS

ITEM No.	PART NAME	BOGEN PART No.	NOTES
M4	Tuning Cap.	80-0125-01	FM, 3 Gang
M5	Tuning Cap.	80-0124-01	AM, 3 Gang (Ant. 36—579mmf, RF 10—503mmf, Osc. 21—172mmf)
M6	Switch	81-001-527	Function Selector (Rotary Wafer Type)
M7	Switch	81-006-009	Power Off-On

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	45-9325-01	FM
Dial Pointer	70-9096-01	AM
Dial Window	12-4021-01	
Knob	03-0559-01	Tuning
Knob	03-0560-01	Power, AFC, Selector

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

CHEVROLET MODEL 988413

CHEVROLET MODEL 988413

CHEVROLET MODEL 988413

TRADE NAME	Chevrolet Model 988413 (For 1961 Chevrolets)
MANUFACTURER	Delco Radio Div., General Motors Corp., Kokomo, Indiana
TYPE SET	Battery Operated 4 Tube — 1 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A5, A9, A10.....GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

A6, A7, A8..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Oscillator core (A5). Rear of core should be 1 5/8" from mounting end of coil form.					
2.	High side thru 82mmf to pin 7 (grid) of Converter. Low side to chassis.	1615KC	"	"	A6, A7, A8	"
3.	"	600KC	600KC Signal.	"	A9, A10	"
4.	"	1615KC	High end stop.	"	A7, A8	"
5.	With radio installed in car and antenna fully extended, tune in a weak station and adjust A8 for maximum output.					

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD946

SET 559 FOLDER 5

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆		RAYTHEON ◆	SYLVANIA ◆	
V1	RF Amplifier	12DZ6	V3	IF Amplifier	12EK6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12DS7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	DS503	Output	2N176		PNP Note 1

Note 1. When replacing, apply silicone grease between transistor and heat sink. Tighten mounting screw securely. Check bias adjustment.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	850	16	7273730	AFH3-54-30			WP300.6		TVLS-3021*
B	400	16							
C	2.2	11.5AC							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#7277422						
C3	.047 75V		P488N-047	DD-503	CUB2S47	IDP-2-473	GEM-2047	2TM-S47
C4A	68 N750 10%		N750-DI 68	TCN-68	C10Q68U	CCTN-680	CNO-447	10TCC-Q68
B	43 N750 10%		N750-DI 39	TCN-43	C10Q39U	CCTN-390	CNO-439	10TCC-Q39
C5	.1 75V		P288N-1	DF-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10
C6		#7273697						
C7	33		DI-33	DD-330	L10T33	CCD-330	GP433	10TS-Q33
C8	.0047		BPD-0047	DD-472	BYAI0D47M	CCD-472	B-247	5HK-D47
C9	560		DI-560	DD-560	L10T56	CCD-561	B-356	10TS-T56
C10A	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
B	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C11	.47 100V		P288N-47		CUB2P47	IDP-4-474	GEM-2047	2TM-P47

Delco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg		7277329					Tone
B	5meg						■ UE4247-S	Volume
C	Switch							Power Off-On
R2	300Ω	2(WW)	7275474*					Bias
	135Ω Stop							

* Temperature Compensated.

■ "STA-LOC" Equivalent: FO56A, RU56A, OS687, IS1375, US41.

(CONTINUED ON REAR PAGE)

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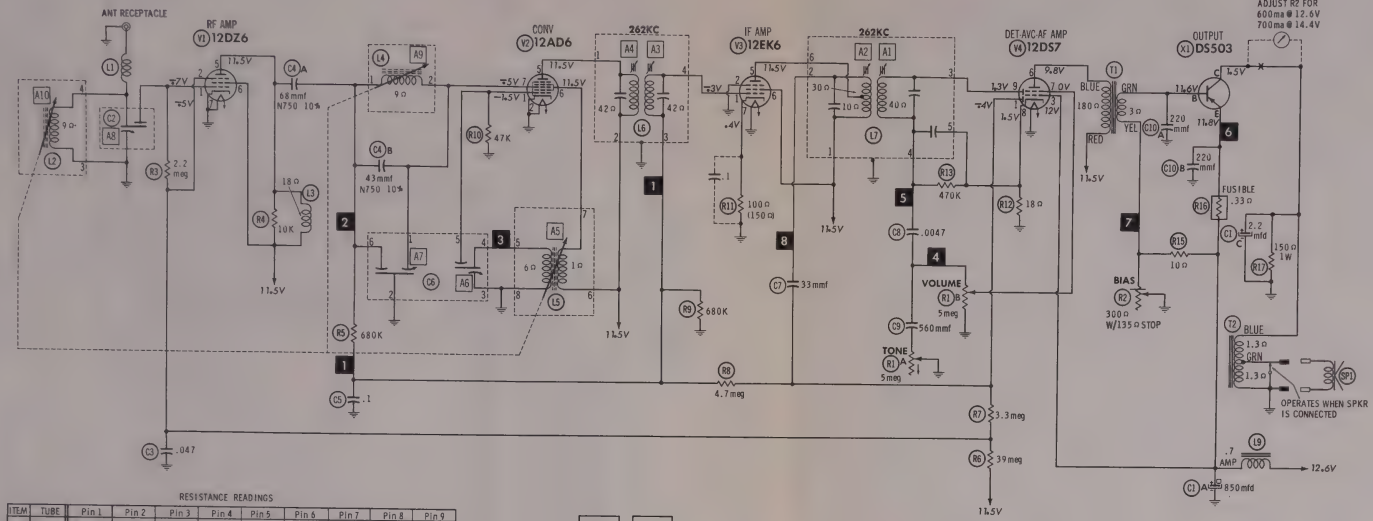
PRINTED BOARD

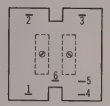
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

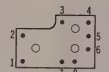


RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	9meg	7meg	FIL	FIL	70Ω	60Ω	0Ω		
V2	12AD6	47K	0Ω	FIL	FIL	100Ω	60Ω	1.3meg		
V3	12EK6	680K	0Ω	FIL	FIL	85Ω	60Ω	100Ω		
V4	12DS7	5meg	TP	4Ω	FIL	FIL	240Ω	0Ω	18Ω	470K

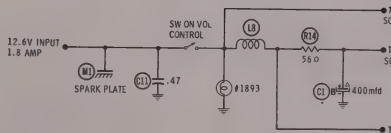
TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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CHEVROLET MODEL 988413

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	2.2meg			
R4	10K			
R5	680K			
R6	39meg			
R7	3.3meg			
R8	4.7meg			
R9	680K			
R10	47K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R11	100Ω			(150Ω) *
R12	18Ω			
R13	470K			
R14	56Ω			
R15	10Ω			
R16	.33Ω			Pt. #7274151
R17	150Ω 1W			

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		DELCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke (6.5uh)	7255738	BC-565	4610	RTC-8520	T859	
L2	Ant.	1221138					
L3	RF Choke (1.8MH)	7269684	BC-514	4664	RTC-8533	T875	
L4	RF	1221138					
L5	Osc.	1221263					
L6	Input IF	1221257	BC-344	13-PH1	RTC-8644	T655	
L7	Output IF	1221255					
L8	Hash Choke (1.4uh)	7241708					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L9	.7A	.7Ω	.011 HY	7274342		TC-2			

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6.8	1	1221590		TA-48			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8Ω Tap@ 3-4Ω	1221535		TA-50			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	4"x 10"	PM	3-4Ω	7277075	410A2	

MISCELLANEOUS

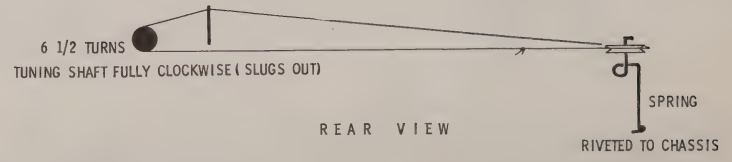
ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Spark Plate	7271564	

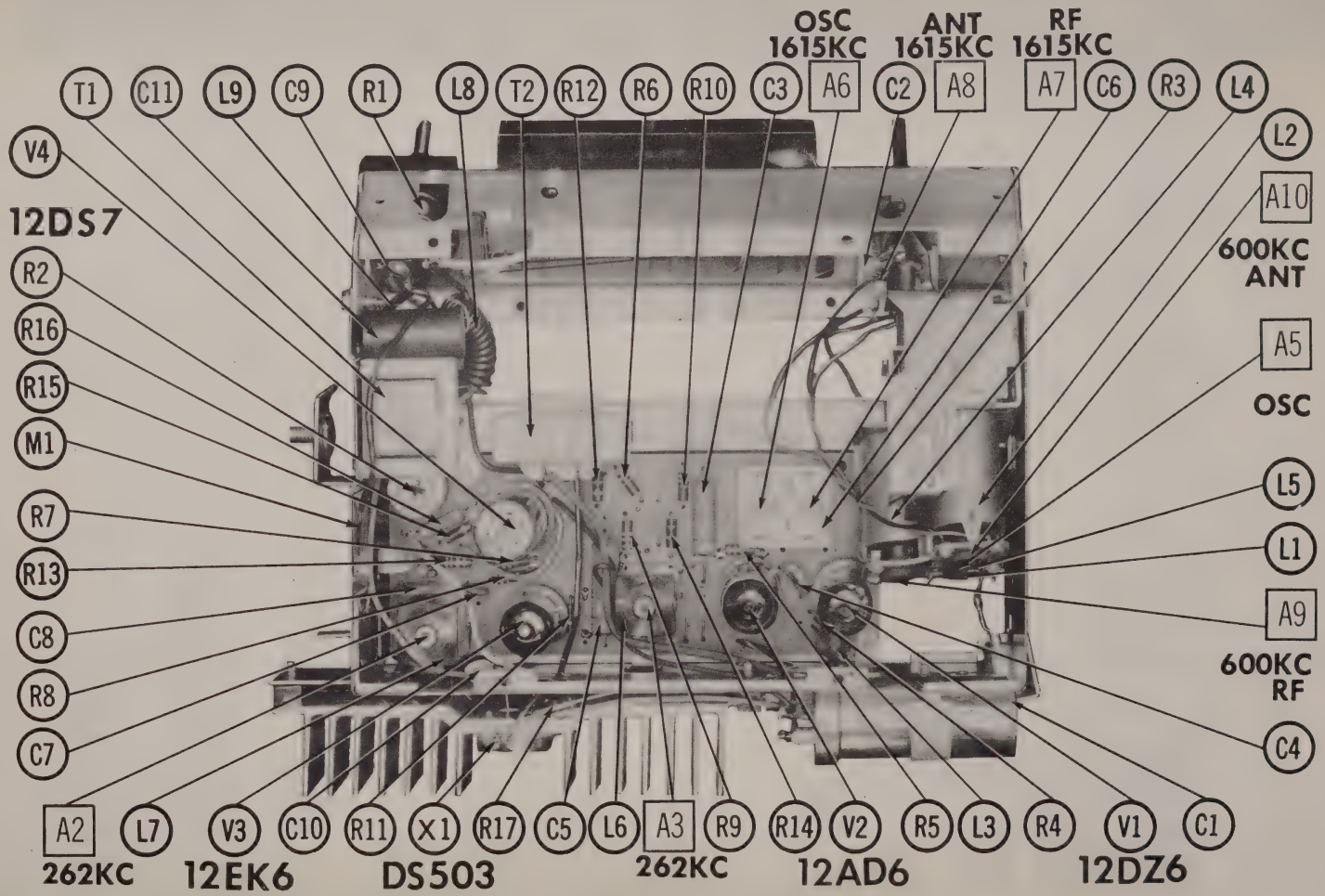
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	7276907	
Knob	7277055	Tuning, Volume
Knob	3785716	Tone
Knob	3785717	Dummy

DIAL CORD STRINGING





CHASSIS TOP VIEW

PHOTOFACT® Folder

**COLUMBIA MODELS
C1459, C1465**

COLUMBIA MODELS
C1459, C1465

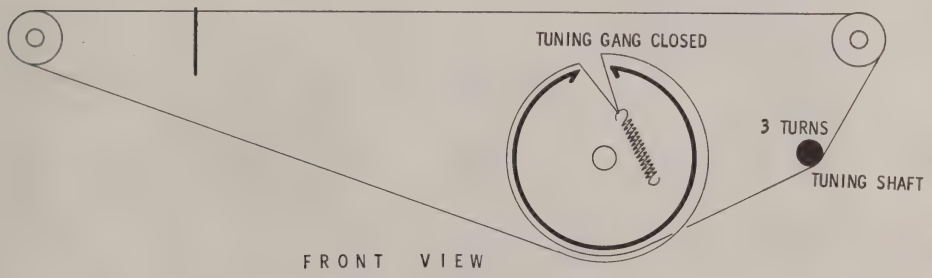
MODEL C1465

COLUMBIA MODELS
C1459, C1465

TRADE NAME	Columbia Models C1459, C1465
MANUFACTURER	Columbia Phonographs, Div. of CBS Electronics, 405 Park Ave., New York, N. Y.
TYPE SET	AC Operated 7 Tube FM-AM Tuner, 4 Tube Stereo Amplifier and 4 Speed Automatic Record Changer (Model C1459 does not include Tuner)
POWER SUPPLY	110 — 120 Volts AC RATING TUNER: 26 Watts, .25 Amp. @117 Volts AC AMP: 57 Watts, .55 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 — 1600KC FREQ. MOD. 88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

DIAL CORD STRINGING

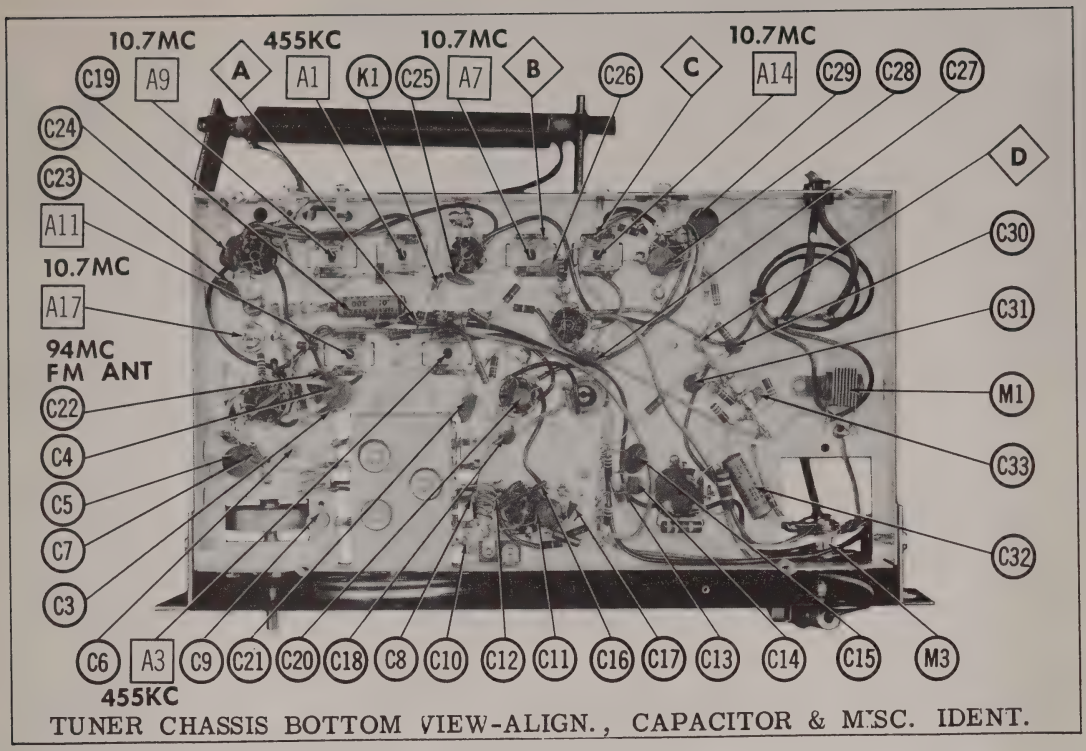


SET 559 FOLDER 6

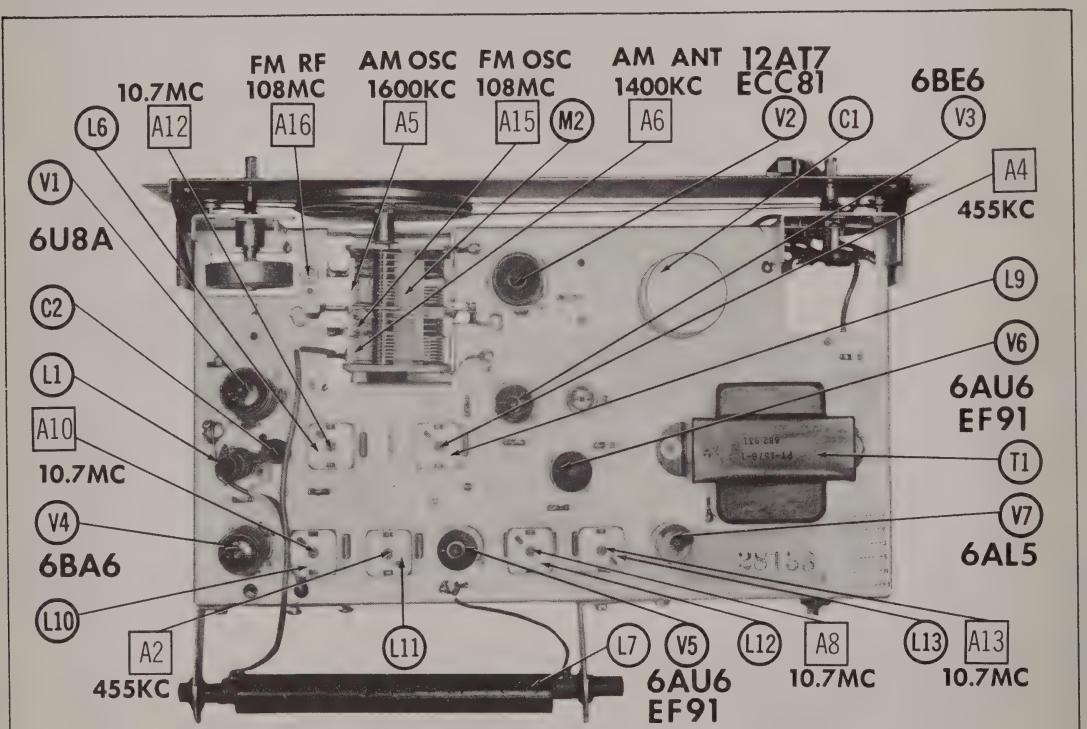
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KN908



TUNER CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & MISC. IDENT.



TUNER CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools:

A1 thru A4, A7 thru A14..GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A16.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A15..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A17..... GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722, 9150, 9298
WALSCO #2516, 2518, 2519

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (Unmod.)	Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	1600KC	1600KC	"	A5	"
3.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1400KC	1400KC Signal.	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 9 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point Ⓒ Common to chassis.	A13	"
6.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to pin 9 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. thru 47K to point Ⓒ. Low side to chassis.	A13	"
6.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓔ. Common to chassis.	A15, A16	Adjust for maximum deflection.
8.	"	88MC	88MC	"	L4, L3	Adjust for maximum deflection by expanding or compressing coil turns.
9.	"	94MC	94MC	"	A17	Adjust for maximum deflection.

FIG. 1

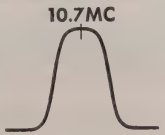
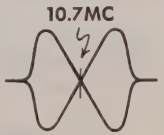
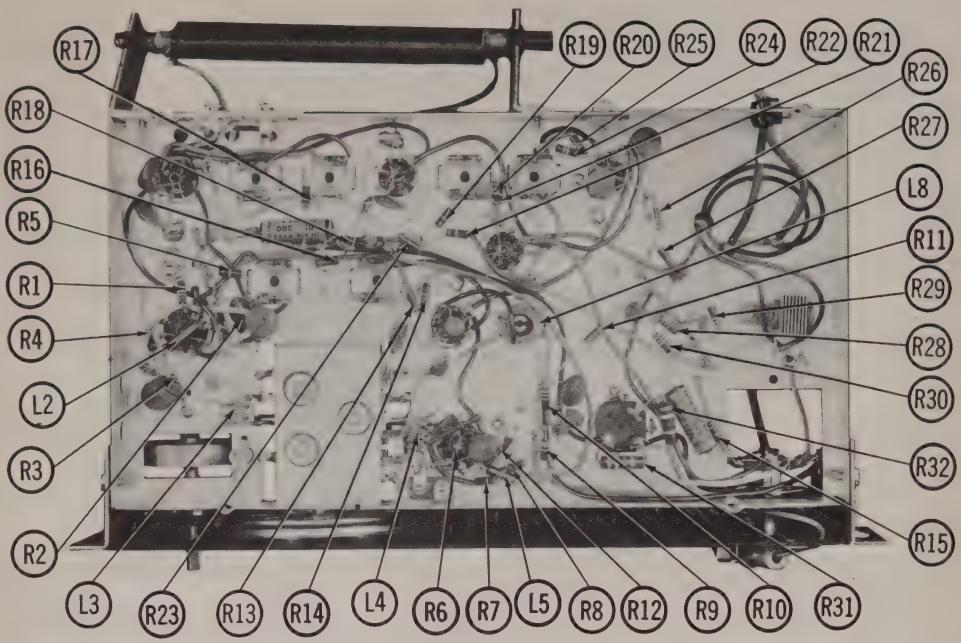
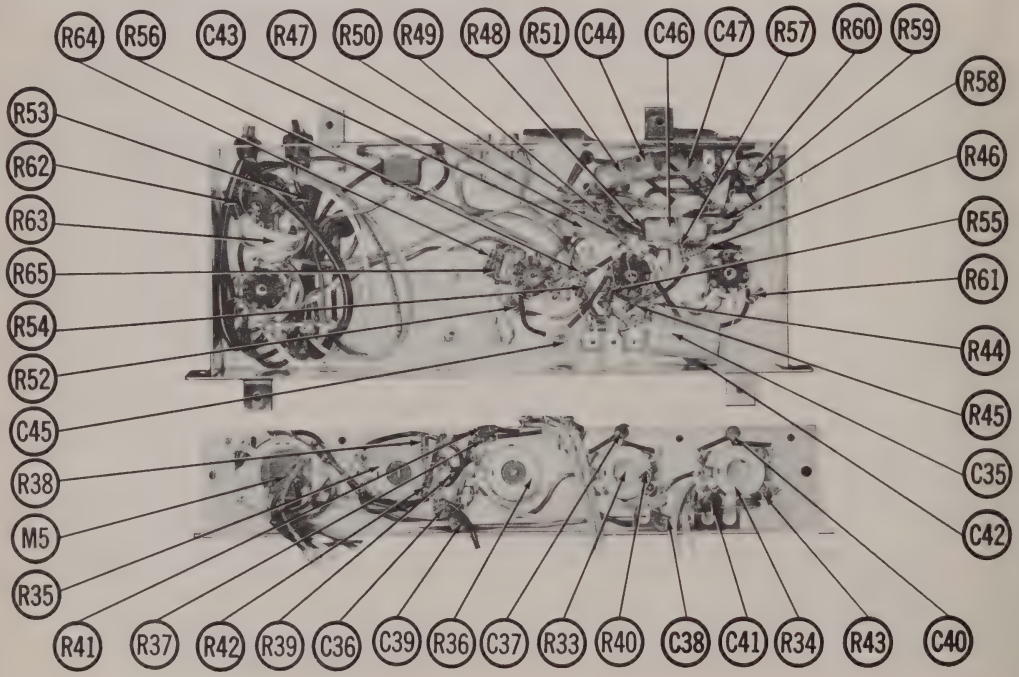


FIG. 2

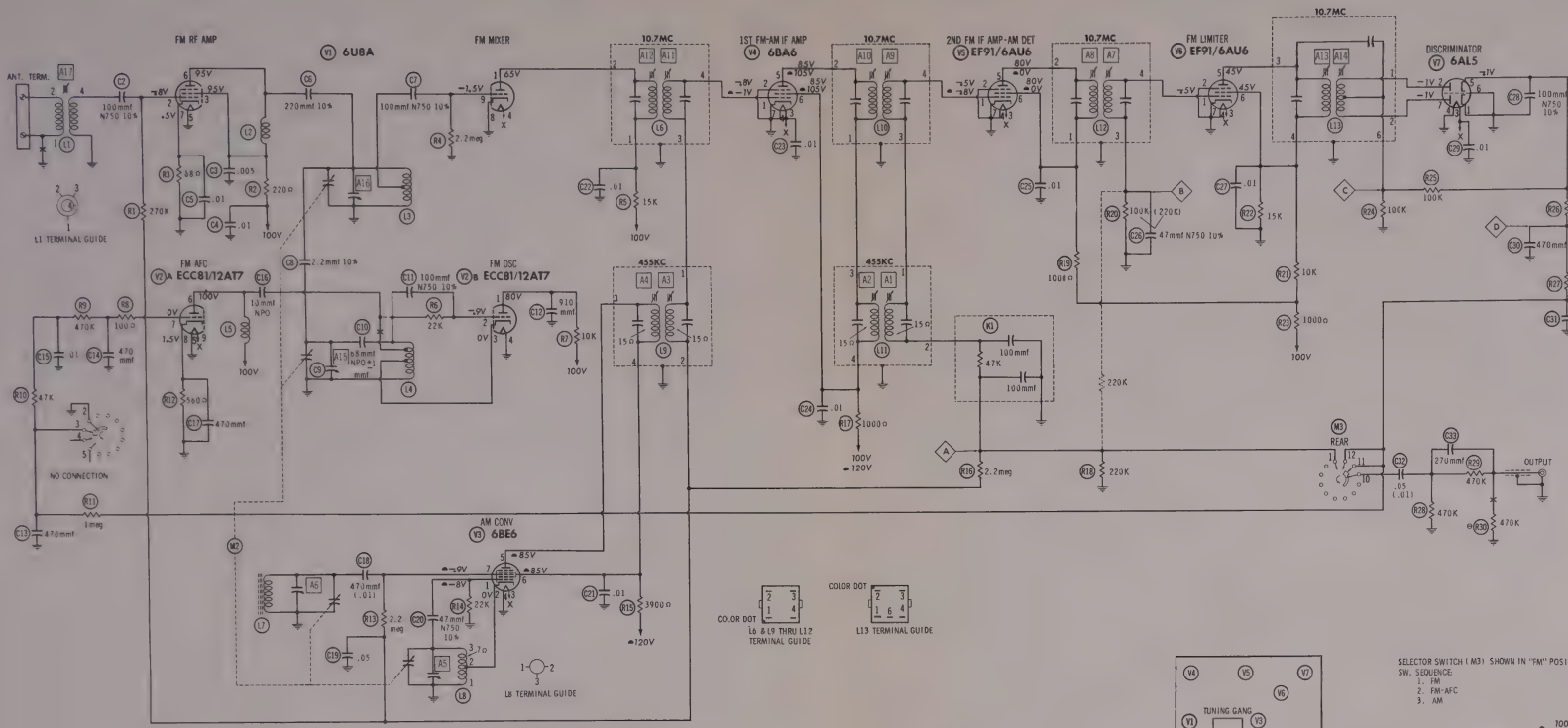


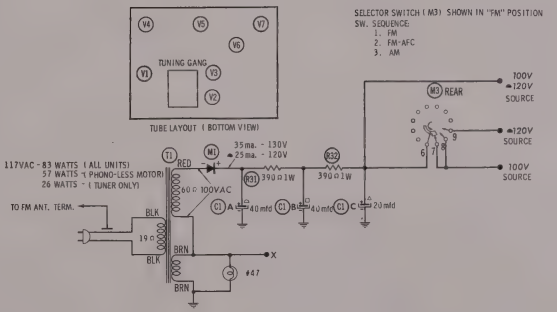


TUNER CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



AMP CHASSIS-BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8A	†16K	2.7meg	†1000Ω	FIL	FIL	†1000Ω	68Ω	0Ω	2.2meg
V2	ECC81 12AT7	†11K	22K	.1Ω	FIL	FIL	†780Ω	520K ▪1.8meg	560Ω	FIL
V3	6BE6	22K	.6Ω	FIL	FIL	▲14700Ω	▲14700Ω	4.6meg		
V4	6BA6	2.4meg	0Ω	FIL	FIL	†1800Ω	†1800Ω	0Ω		
V5	EF91 6AU6	270K	0Ω	FIL	FIL	†2800Ω	†2800Ω	0Ω		
V6	EF91 6AU6	100K	0Ω	FIL	FIL	†10K	†10K	0Ω		
V7	6AL5	0Ω	100K	FIL	FIL	170K ▪200K	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▲ MEASURED IN "AM" POSITION. ▪ MEASURED IN "FM-AFC" POSITION.
† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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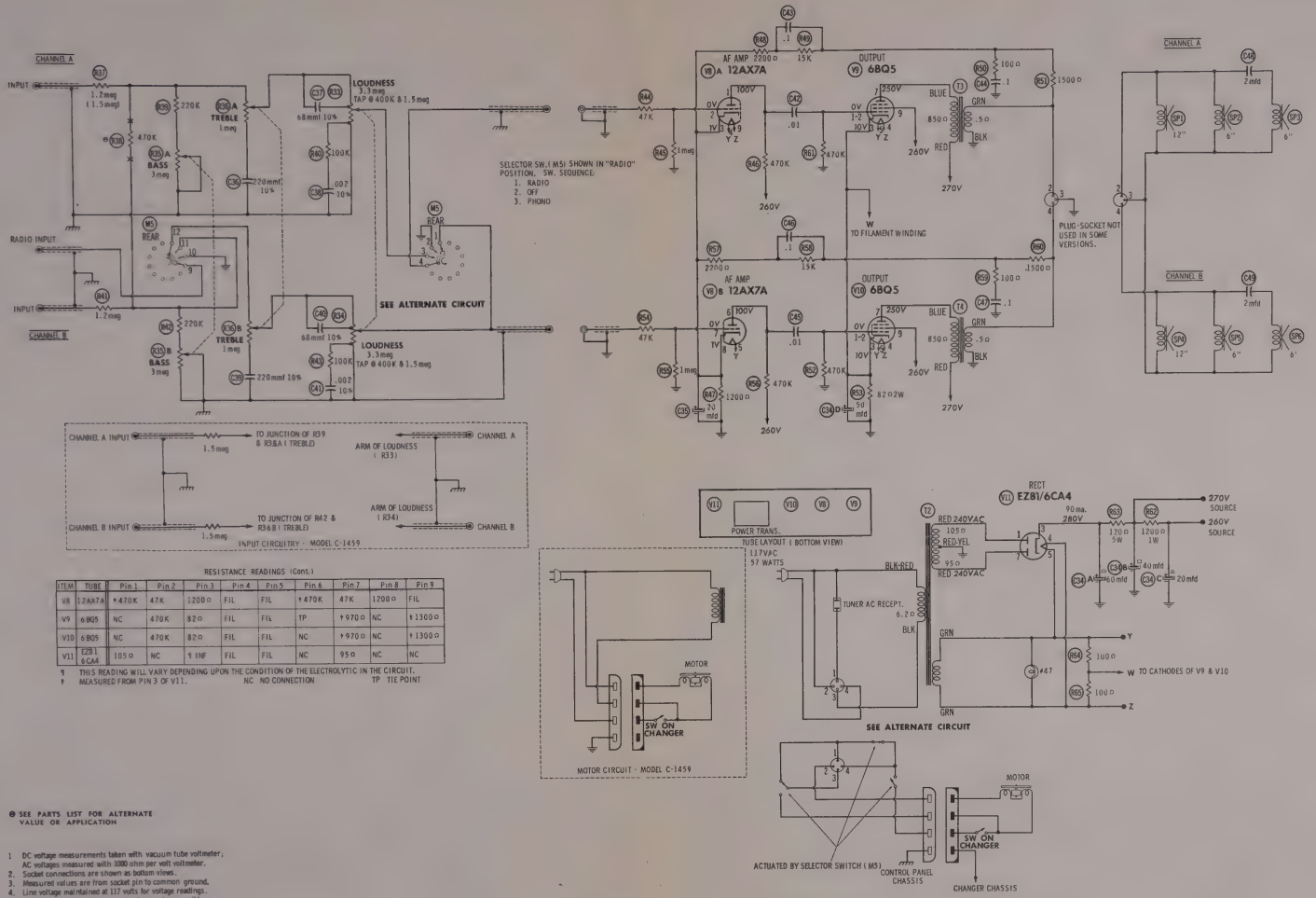
COLUMBIA MODELS C1459, C1465

TUNER SCHEMATIC



RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AX7A	†470K	47K	1200Ω	FIL	FIL	†470K	47K	1200Ω	FIL
V9	6BQ5	NC	470K	82Ω	FIL	FIL	TP	†970Ω	NC	†1300Ω
V10	6BQ5	NC	470K	82Ω	FIL	FIL	NC	†970Ω	NC	†1300Ω
V11	EZ81 6CA4	105Ω	NC	¶ INF	FIL	FIL	NC	95Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V11. NC NO CONNECTION TP TIE POINT

@ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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COLUMBIA MODELS C1459, C1465

AMP SCHEMATIC

SET 559 FOLDER 6

PAGE 7

PAGE 8

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	6U8A
V2	FM Osc. -FM AFC	ECC81/12AT7
V3	AM Converter	6BE6
V4	1st FM-AM IF Amplifier	6BA6
V5	2nd FM IF Amp. -AM Det.	EF91/6AU6
V6	FM Limiter	EF91/6AU6
V7	Discriminator	6AL5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲40	200	11G761	AFH2-54			FP318.74	TMD-2205	TVL-3485
B	■40	200		PRS1570				TD-20-350	
C	▲20	200							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C3	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C4	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C7	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C8	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C9		#20F337						
C10	68 NPO ± 1mmf		NPO-SI 68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C11	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12	910			DD-911	L10T91	CM-19B-911M		
C13	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C14	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C15	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C17	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C18	470	(.01) †	DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C19	.05 200V		CUB2S5	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C20	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C21	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C27	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C29	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C31	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C32	.05 200V	(.01) †	P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C33	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27

Columbia Part Number.
† Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	COLUMBIA PART No.	REPLACEMENT DATA
K1	AM Diode Filter	100mmf, 100mmf, 47K		Aerovox PA-97 Centralab PC-50 Sprague D-1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REPLACEMENT DATA REMARKS
R1	270K			
R2	220Ω			
R3	68Ω			
R4	2.2meg			
R5	15K			
R6	22K			
R7	10K			
R8	100Ω			
R9	470K			
R10	47K			
R11	1meg			
R12	560Ω			
R13	2.2meg			
R14	22K			
R15	3900Ω			
R16	2.2meg			
R17	1000Ω			
R18	220K			
R19	1000Ω			
R20	100K			(220K) *
R21	10K			
R22	15K			
R23	1000Ω			
R24	100K			
R25	100K			
R26	33K			
R27	33K			
R28	470K			
R29	470K			
R30	470K			Note 1
R31	390Ω 1W			
R32	390Ω 1W			

* Alternate Value.
Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA COLUMBIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	FM Ant.	20F334					
L2	RF Choke(4.7uh)	21F209	SW-631	4529	RTC-8505	T819	
L3	FM RF	20F336					
L4	FM Osc.	20F335					
L5	RF Choke(2.7uh)	21F210	SW-630	4606	RTC-8517	T857	
L6	1st FM IF	20F330	FM-254	1463	RTC-8599	T633	
L7	Loopstick	20G362	BC-393	70-OSC	RTC-8647	T532	
L8	AM Osc.	20G361	BC-393	70-OSC	RTC-8647	T512	
L9	1st AM IF	20F329	BC-352	12-C1	RTC-8632	T607	
L10	2nd FM IF	20F330	FM-254	1463	RTC-8599	T633	
L11	2nd AM IF	20F329	BC-353	12-C2	RTC-8633	T608	
L12	3rd FM IF	20F330	FM-254	1463	RTC-8599	T633	
L13	Discriminator	20F331	FM-253	1464	RTC-8665	T634	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ .25A	100V@ .035A Tap@ 6.3V@ 2.4A		2G121					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.035A	10G617 †	1N1763 ♦	65 † †	† Selenium ♦ Silicon

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M2	Tuning Cap.	14G112	2 Gang (Ant. 6—220mmf, Osc. 11—125mmf)
M3	Switch	19G709	Function Selector, Rotary Type

AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V8	Channel A AF Amp. - Channel B AF Amp.	12AX7A
V9	Channel A Output	6BQ5
V10	Channel B Output	6BQ5
V11	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C34A	▲50	400	1IG812	AFH3-123-65	C0870	XC4-79	FP431.35	TMT-3628	TVL-4660
B	▲40	350		PRSI265	BR6045		TC75	TD-50-450	
C	▲20	300							
D	50	25							
C35	20	25	1IG813	PRSI330	BBR20-25	QT1-9	TC45	TD-20-25	TVA-1305.5

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

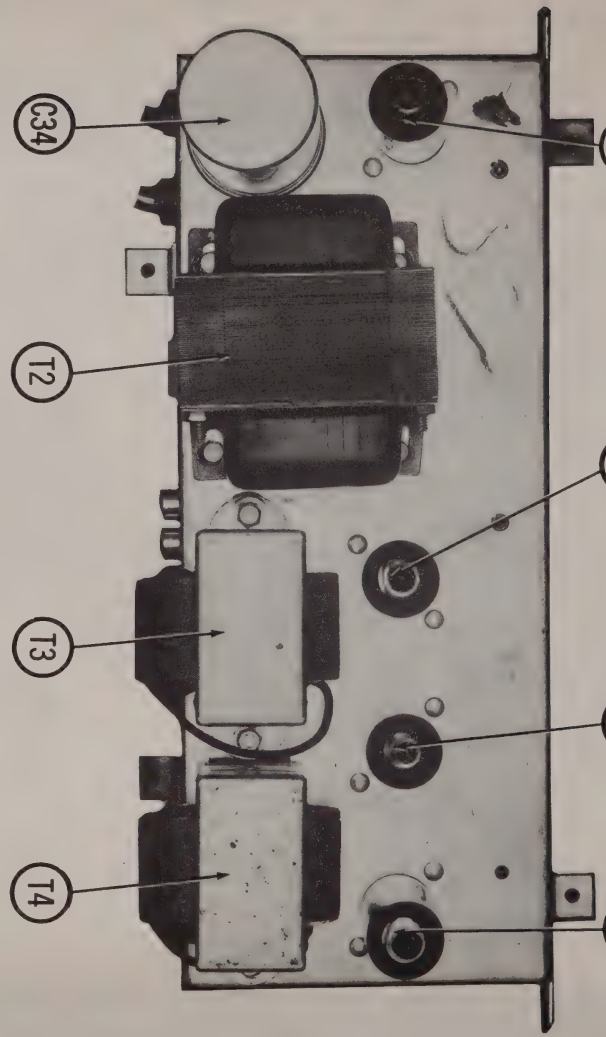
ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C36	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C37	68 10%		DI-68	DD-680	L10Q68	CCD-680	GP468	10TS-Q68
C38	.002 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C39	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C40	68 10%		DI-68	DD-680	L10Q68	CCD-680	GP468	10TS-Q68
C41	.002 10%		DD-2000		5R5D2	CCD-202	GP220	10TS-D20
C42	.01		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C43	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C44	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C45	.01		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C46	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C47	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C48	2.0mfd 50V		P2123ZNN-2.0		WMF1W2E			
C49	2.0mfd 50V		P2123ZNN-2.0		WMF1W2E			

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R33	3.3meg*	1	9G670	BT-180			UDT-303	Loudness, Channel A
R34	3.3meg*	1	9G670	BT-180			UDT-303	Loudness, Channel B
R35A	3meg	1	9G668	B-85			FA36A	Bass, Channel B
B	3meg	1		SR-85			RU36A	Bass, Channel A
C	Shaft			Not Req.			CS3500	
R36A	1meg	1	9G669	B-69	AD47-1meg-S		FA16L	Treble, Channel B
B	1meg	1		SR-69	Not Req.		RU16L	Treble, Channel A
C	Shaft			Shaft	KSS-3		CS3500	

* Taps @ 400K and 1.5meg.

AMP CHASSIS—TOP VIEW



AMP PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: WORKMAN TV PART No.	REPLACEMENT DATA: REMARKS
R37	1.2meg			(1.5meg)* Note 1
R38	470K			
R39	220K			
R40	100K			
R41	1.2meg			(1.5meg) *
R42	220K			
R43	100K			
R44	47K			
R45	1meg			
R46	470K			
R47	1200Ω			
R48	2200Ω			
R49	15K			
R50	100Ω			
R51	1500Ω			
R52	470K			
R53	82Ω 2W			
R54	47K			
R55	1meg			
R56	470K			
R57	2200Ω			
R58	15K			
R59	100Ω			
R60	1500Ω			
R61	470K			
R62	1200Ω 1W			
R63	120Ω 5W	PW5-120	5W-SQ-120	
R64	100Ω			
R65	100Ω			

Note 1. Not used in some versions.
* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	117V @ .55A	480VCT @ .090A DC	6.3V @ 2.9A	2G126		PC-8420①			① Drill New Mounting hole(s).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	7500Ω	3-4Ω	3G271	A-3020	A-3823	26S48	S-9Z	
T4	7500Ω	3-4Ω	3G271	A-3020	A-3823	26S48	S-9Z	

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: COLUMBIA PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	1G180	12A6PA	
SP2	6"	PM	6-8Ω	1G179	6A21Z6,4	
SP3	6"	PM	6-8Ω	1G179	6A21Z6,4	
SP4	12"	PM	6-8Ω	1G180	12A6PA	
SP5	6"	PM	6-8Ω	1G179	6A21Z6,4	
SP6	6"	PM	6-8Ω	1G179	6A21Z6,4	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	COLUMBIA PART No.: CARTRIDGE	COLUMBIA PART No.: NEEDLE*	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE*	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE*	SONOTONE PART No.: CARTRIDGE	SONOTONE PART No.: NEEDLE*	NOTES
M4	SC-7S	Not Req.	17	Not Req.			16T-S	Not Req.	

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M5	Switch	19G768	Selector, Rotary Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8G564	Amplifier
Knob	8G565	Tuner
Cabinet	17G151	Mahogany
Cabinet	17G152	Walnut
Handle	18G924	Gold

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**CURTIS MATHES
MODEL 3719**

CURTIS MATHES
MODEL 3719

CURTIS MATHES
MODEL 3719

TRADE NAME	Curtis Mathes Model 3719
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas, Texas
TYPE SET	AC-DC Operated 6 Tube AM Receiver
POWER SUPPLY	110 – 120 Volts AC-DC RATING 25 Watts, .25 Amp. @ 117 Volts AC
TUNING RANGE – BROADCAST	540 – 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4..... .....GENERAL CEMENT#5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1400KC	1400KC	"	A5	"
3.	Loop	1400KC	1400KC Signal.	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KG762

SET 559 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆		RAYTHEON ◆ SYLVANIA ◆			
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BA6	V4	Det. -AVC-AF Amp.	12AV6
V2	Converter	12BE6	V5	Output	35C5
V3	IF Amplifier	12BA6	V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▬50	150	4A4	PWH4-34-50	D0325	FP409.6	TMQ-4050	TVL-4415	
B	■40	150							
C	▲10	150							
D	50	15							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.01 200V		P288N-01	DD-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C3	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C4	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C5	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	47 N750 10%		N750-D1 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C7	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C8	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C9	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C10	.005 10%		DI-5000		5R5D5	CCD-502	JL-250	10TS-D50
C11	.005 10%		DI-5000		5R5D5	CCD-502	JL-250	10TS-D50
C12	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-503	GEM-6147	6TM-S47
C13	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-503	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	⅓	2A48	F1-41		† QJ-1544R	■	Tone
B	1meg			R2-61				Volume
	100K Tap							
C	Switch			KR-1				Power Off-On

† "CONCENTRIKIT" Equivalent: K-5 Kit with Base Elements and Shafts. B13-133, P1-020 (Panel) B18-137X, R1-100 (Rear) 76-1 (Switch)
(Not available as a factory assembled unit).

■ "STA-LOC" Equivalent: FB55A, RU16T15, OU3000, IS1000, US41.

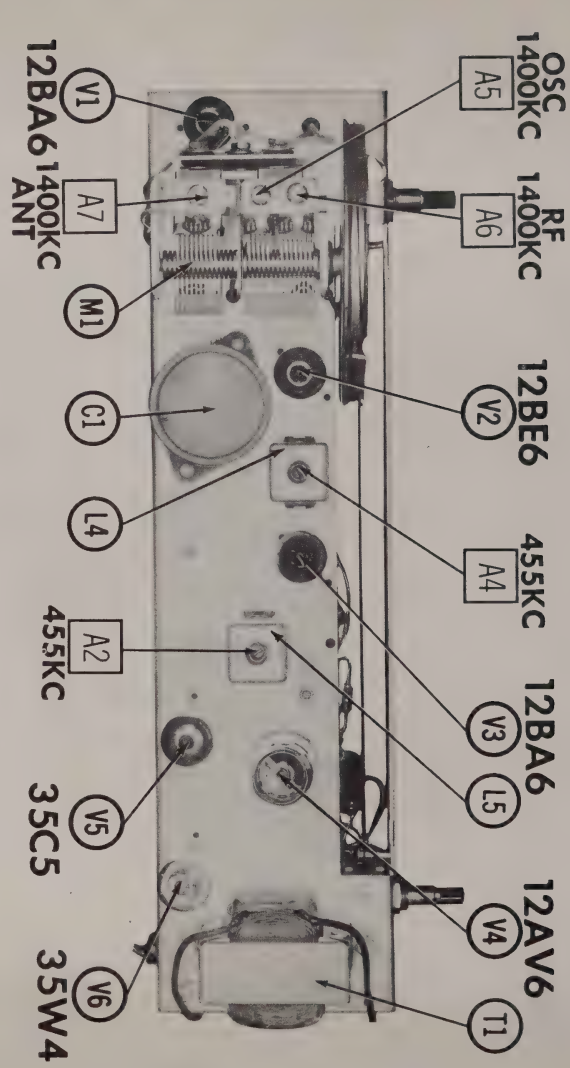
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	3.3meg				R10	6.8meg			
R3	12K				R11	47K			
R4	68K				R12	2.2meg			
R5	100Ω				R13	200Ω			
R6	27K				R14	1000Ω			
R7	100Ω				R15	220Ω 2W			
R8	180Ω			(100Ω) †	R16	15Ω 2W			
R9	470K								

† Alternate.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Curtis Mathes PART No.	REPLACEMENT DATA
K1	Diode Filter	(2) 100mmf, 47K		Aerovox PA-97 Centralab PC-50 Sprague D-1
K2	Audio Coupling	250mmf, .01mfd, (2) 470K		Aerovox PA-112-3 Centralab PC-80 Mallory MS-108 Sprague T-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Curtis Mathes PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	1A35	BC-419	705-A		T532	
L2	RF	1A34					
L3	Osc.	1A45	BC-381	71-OSC	RTC-8648	T502	
L4	Input IF	1A7	BC-352	14-C1	RTC-8632	T607	
L5	Output IF	1A8	BC-355	14-C6	RTC-8634	T609	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2800Ω	3-4Ω	10A24	A-3018	A-3849	26S50	S-50X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Curtis Mathes PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	69CV-23	69A3	

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M1	Tuning Cap.	3A11	3 Gang (Ant. 35—250mmf, RF 12—240mmf, Osc. 16—117mmf)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

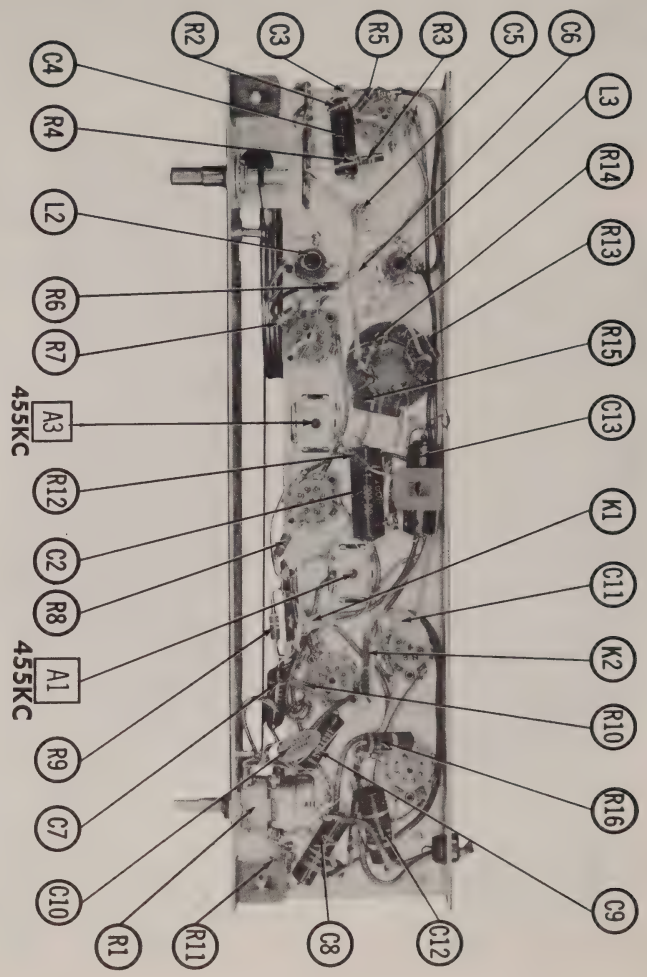
NAME	PART NO.	DESCRIPTION
Dial Glass	2B16	
Knob	11B16	Tuning
Knob	11B7-1	Volume
Knob	11B15	Tone

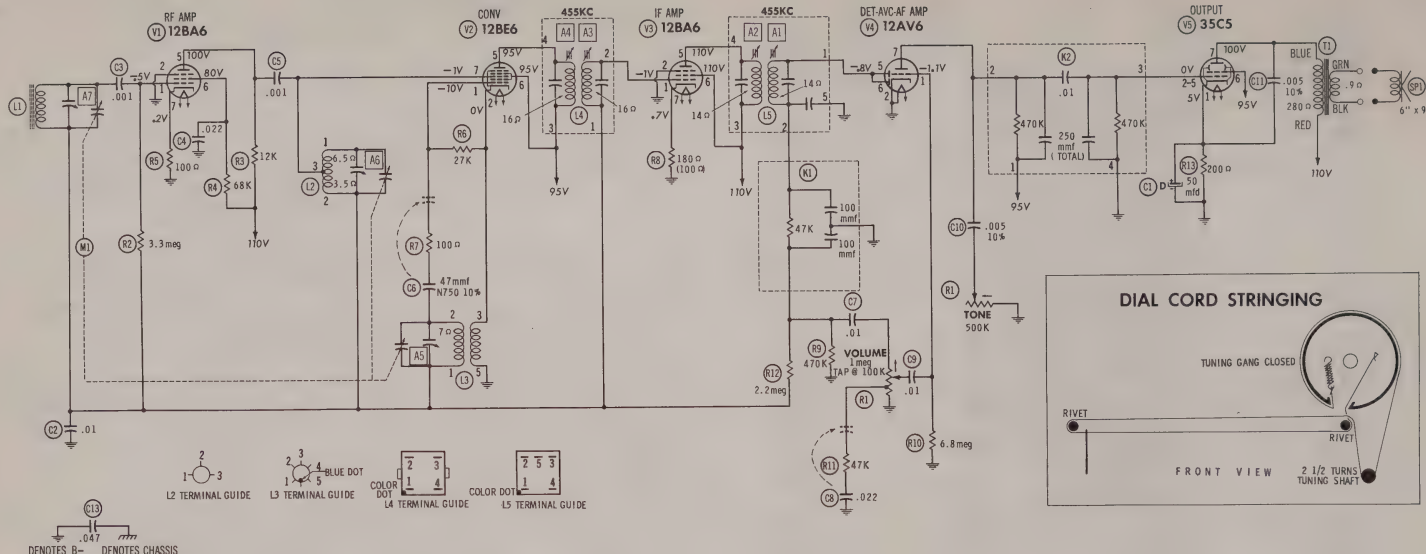
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	6 meg	0 Ω	60 Ω	45 Ω	†12K	†68K	100 Ω
V2	12BE6	27K	.1 Ω	45 Ω	30 Ω	†1200 Ω	†1200 Ω	2.7 meg
V3	12BA6	2.7 meg	0 Ω	30 Ω	15 Ω	†250 Ω	†250 Ω	180 Ω
V4	12AV6	6.8 meg	0 Ω	15 Ω	0 Ω	520K	520K	†470K
V5	35C5	200 Ω	NC	100 Ω	60 Ω	470K	†1200 Ω	†515 Ω
V6	35W4	NC	NC	100 Ω	140 Ω	140 Ω	135 Ω	¶ INF

† MEASURED FROM PIN 7 OF V6 NC NO CONNECTION

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CURTIS MATHES MODEL 3719

PHOTOFACT® Folder with CIRCUITRACE®

**FUJIYA MODEL
TRP-61**

FUJIYA MODEL
TRP-61

FUJIYA MODEL
TRP-61

TRADE NAME	Fujiya Model TRP-61
IMPORTER	Fujiya Corp., Suite 3202 Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver With 3 Speed Manual Record Player
POWER SUPPLY	9 Volts DC
RATING	8 MA @ 9 Volts DC (No Signal, Min. Volume) Less Motor
TUNING RANGE	BROADCAST 535 - 1605KC
	15 MA @ 9 Volts DC (Signal, Normal Volume) Less Motor

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5 ... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

A4, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3	Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal	"	A6	"
5.	"	600KC	600KC Signal	"	A7	Adjust for maximum output by moving antenna coil turns along ferrite loop. Repeat steps 2 thru 5.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KO861

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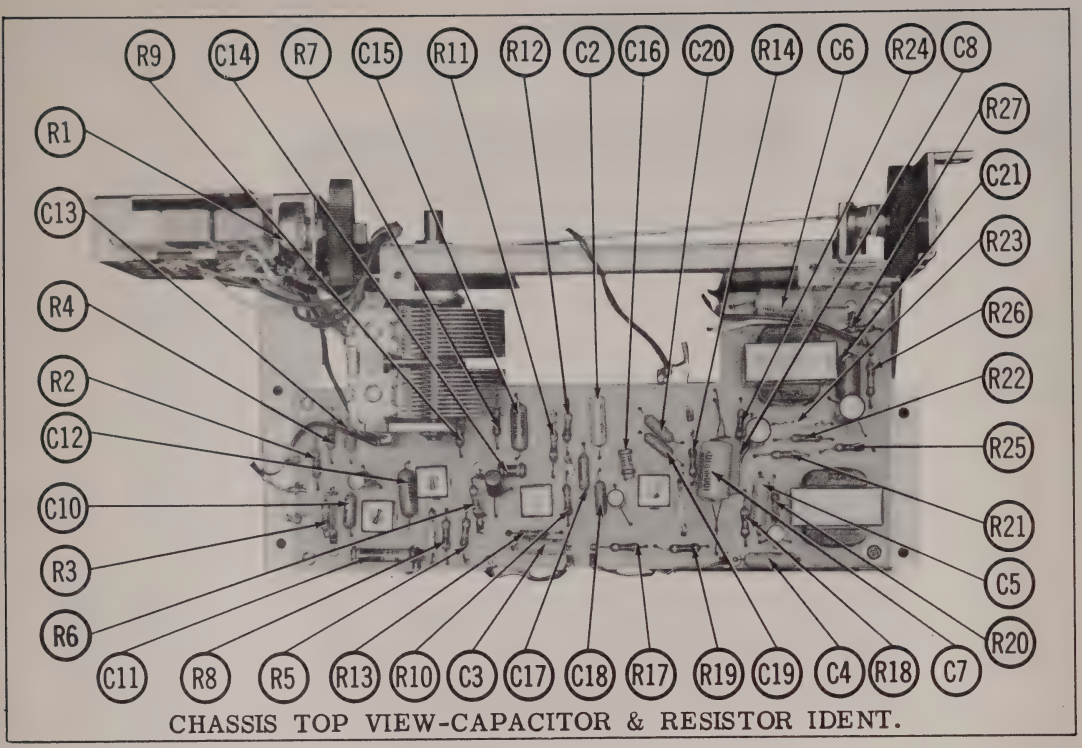
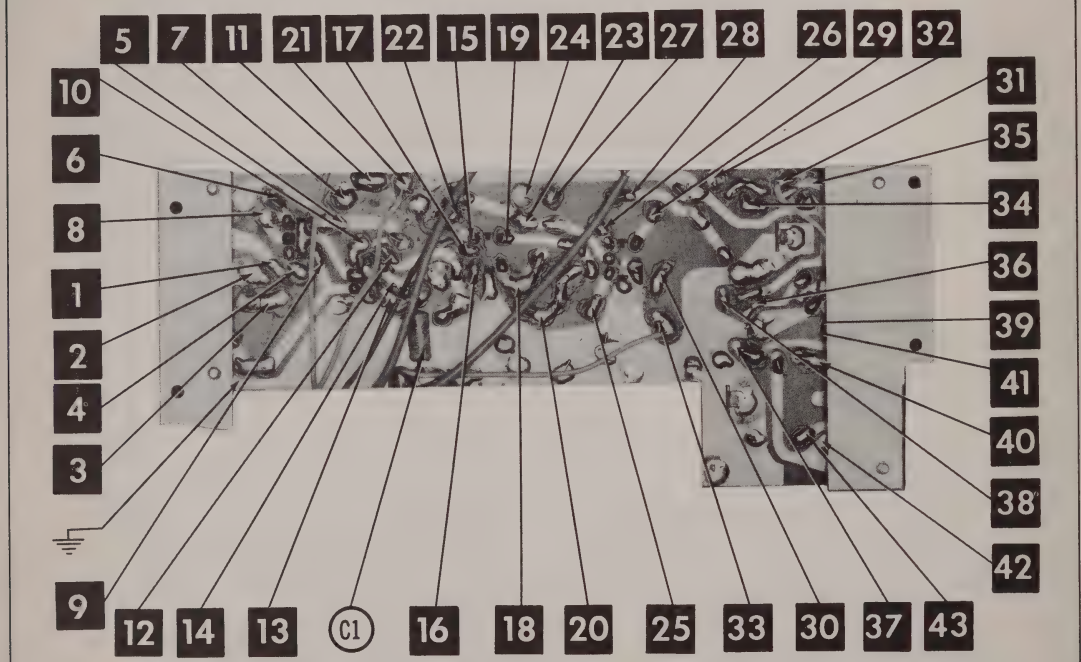
SET 559 FOLDER 8



CHASSIS TOP VIEW-CAPACITOR & RESISTOR IDENT.



A Howard W. Sams CIRCUITRACE* Photo

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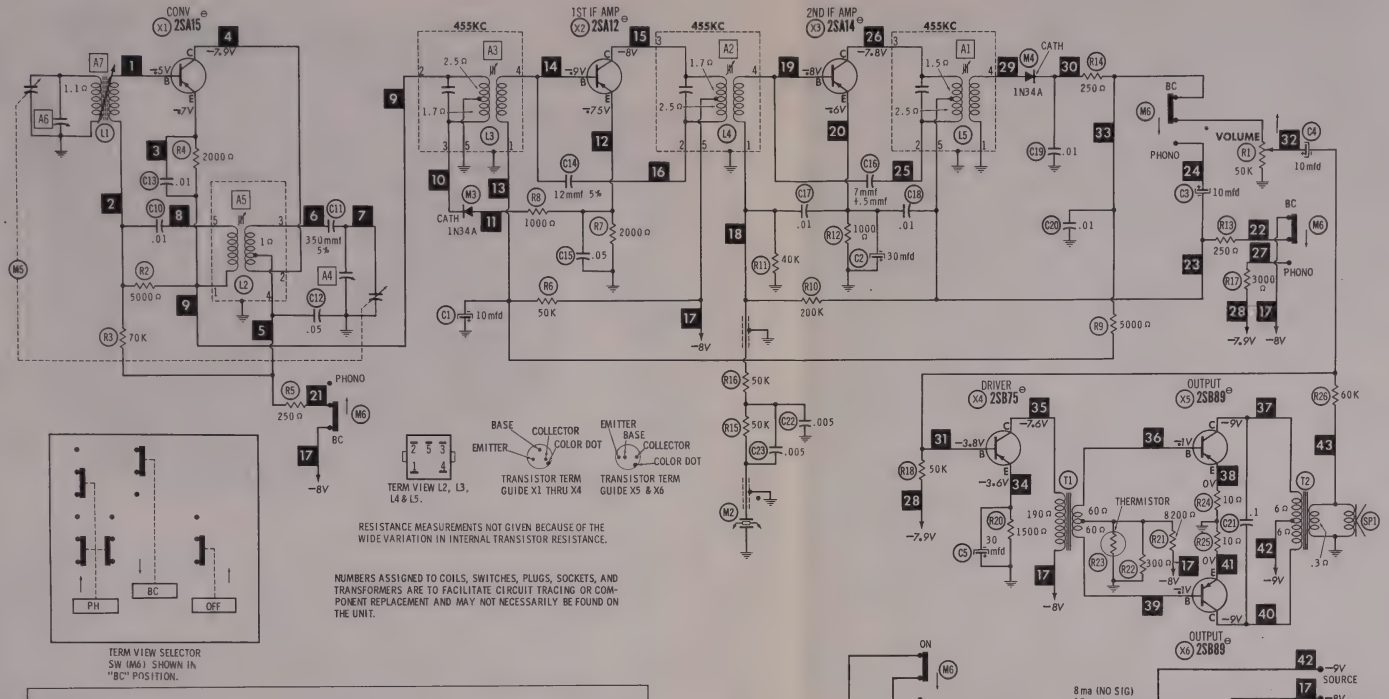


TERM VIEW SELECTOR SW (M6) SHOWN IN "BC" POSITION.

TERM VIEW L2, L3, L4 & L5.

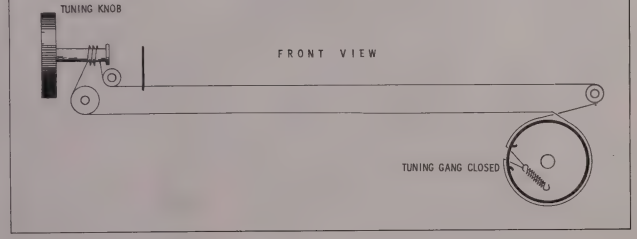
TRANSISTOR TERM GUIDE X1 THRU X4

TRANSISTOR TERM GUIDE X5 & X6

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DIAL CORD STRINGING



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

FUJIYA MODEL TRP-61

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2SA15	Converter	2N412		PNP
	2N219 *	Converter			PNP
X2	2SA12	1st IF Amplifier	2N410		PNP
	2N218 *	1st IF Amplifier			PNP
X3	2SA14	2nd IF Amplifier	2N410		PNP
	2SA12 *	2nd IF Amplifier			PNP
	2N218 *	2nd IF Amplifier			PNP
X4	2SB75	Driver	2N406		PNP
	2N215 *	Driver			PNP
X5	2SB89	Output	2N408		PNP
	2SB79 *	Output			PNP
	HJ34A *	Output			PNP
X6	2SB89	Output	2N408		PNP
	2SB79 *	Output			PNP
	HJ34A *	Output			PNP

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FUJIYA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	10		PTT39	NLW10-15	MT1-5	TT12X10	MLV10-10	TE-1114
C2	30	6		PTT27	NLW30-6	MT1-13	TT6X30	MLV30-6	TE-1092
C3	10	6		PTT23	NLW10-6	MT1-5	TT6X10	MLV10-6	TE-1087
C4	10	6		PTT23	NLW10-6	MT1-5	TT6X10	MLV10-6	TE-1087
C5	30	6		PTT27	NLW30-6	MT1-13	TT6X30	MLV30-6	TE-1092
C6	100	10		PTT46	NLW100-12	MT1-19	TT15X100	MLV100-10	TE-1119.3
C7	100	10		PTT46	NLW100-12	MT1-19	TT15X100	MLV100-10	TE-1119.3
C8	100	10		PTT46	NLW100-12	MT1-19	TT15X100	MLV100-10	TE-1119.3
C9	100	15		PTT73	NLW100-15	MT1-19	TT15X100	MLV100-15	TE-1162

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	.01			SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C11	350	5%			5R5T36	CM-19B-363J			MS-336
C12	.05				DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C13	.01			SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C14	12	5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C15	.05				DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C16	7	±.5mmf		NPO-SI 6.8	TCZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TCC-V68
C17	.01			SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C18	.01			SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	.01		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C20	.01		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C21	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P10
C22	.005		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	.005		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C24	.01		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FUJIYA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	50K	1/4						Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	5000Ω				R16	50K			
R3	70K				R17	3000Ω			
R4	2000Ω				R18	50K			
R5	250Ω				R19	1000Ω			
R6	50K				R20	1500Ω			
R7	2000Ω				R21	8200Ω			
R8	1000Ω				R22	300Ω			
R9	5000Ω				R23	Thermistor			
R10	200K				R24	10Ω			
R11	40K				R25	10Ω			
R12	1000Ω				R26	60K			
R13	250Ω				R27	250Ω			
R14	250Ω				R28	160Ω 1W			
R15	50K								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		FUJIYA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick		BC-419	705-A		T532	
L2	Osc.						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						
L6	Motor Choke						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	FUJIYA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.2	1	84241-A					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	FUJIYA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	250Ω CT	3-4Ω	84241-B					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FUJIYA PART No.	QUAM PART No.	
SP1	3" x 6"	PM	3-4Ω	84568		

BATTERIES

ITEM No.	VOLTAGE	FUJIYA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-1		230		A100		M-13R	6 Required

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	FUJIYA PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	84351 84559 ♦	G1-LP * (LP) G1-SP * (78RPM)	120TS KR314T ♦	N8-1 * N8-3 *	76S	Not Req.	12THA-S T81-12THA-S ♦ †	N12THA-S *	♦Includes Tone Arm. †Parallel for Monaural Operation.

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FUJIYA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M3	1N34A			1N34A	Overload
M4	1N34A			1N34A	Detector

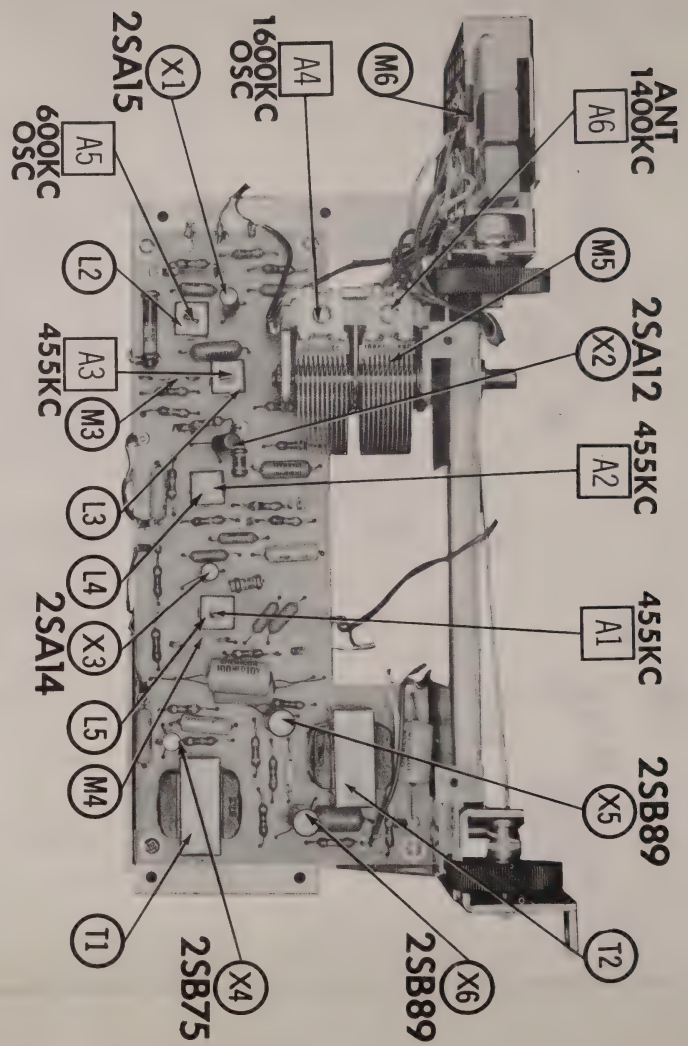
MISCELLANEOUS

ITEM No.	PART NAME	FUJIYA PART No.	NOTES
M5	Tuning Cap.		2 Gang
M6	Switch		Function Selector (Pushbutton Type)
M7	Motor	24990	3 Speed
	Idler	23281	
	Adapter	30170	45RPM

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



PHOTOFACT® Folder

**HARPERS MODEL
UC-101**

HARPERS MODEL
UC-101

HARPERS MODEL
UC-101

TRADE NAME	Harpers Model UC-101
IMPORTER	Harpers International, Inc., 315 Fifth Ave., New York 16, N. Y.
TYPE SET	AC-DC Operated 5 Tube BC-SW Receiver
POWER SUPPLY	110 – 120 Volts AC-DC RATING 25 Watts, .25 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1600KC SHORT WAVE 3.9 – 12MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4, A6, A10, A11..... GENERAL CEMENT #8721, 8722
WALSCO #2519

A5, A7, A8, A9..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru .1mfd to hank antenna lead.	1600KC	1600KC	"	A5	"
3.	"	600KC	600KC	"	A6	"
4.	"	1400KC	1400KC Signal.	"	A7	"
5.	"	12MC	(SW) 12MC	"	A8, A9	"
6.	"	3.9MC	3.9MC	"	A10, A11	Adjust for maximum output. Repeat Steps 2 thru 6 if necessary.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KG857

SET 559 FOLDER 9

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Det. -AVC-AF Amp.	12AV6
V4	Output	35C5
V5	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA HARPERS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	40	150		PRS3650	BBRT44215	QT3-5	TCT3116	TDLT-4	TVA-3450
B	40	150							
C	20	150							
C2	20	25		PTT81	NLW20-50	MT1-9	TT25X20	MLV25-25	TE-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C4	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C5A								
B								
C								
D								
C6	.005 5%		1464-005		1R5D5	CM-20B-502J	MCE465	MS-25
C7	440 5%				5R5T43	CM-19B-441J		MS-343
C8	100 5%			TCZ-100	22R5T1	CM-19B-101J	MCE235	MS-31
C9	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C10	.05		BPD-05	DD-503	CUB4S5	4DP-3-503	GP150	5HK-S50
C11	200 10%		NPO-SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C12	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-201	4TM-S10
C13	200 10%		NPO-SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C14	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C15	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CONTROLS

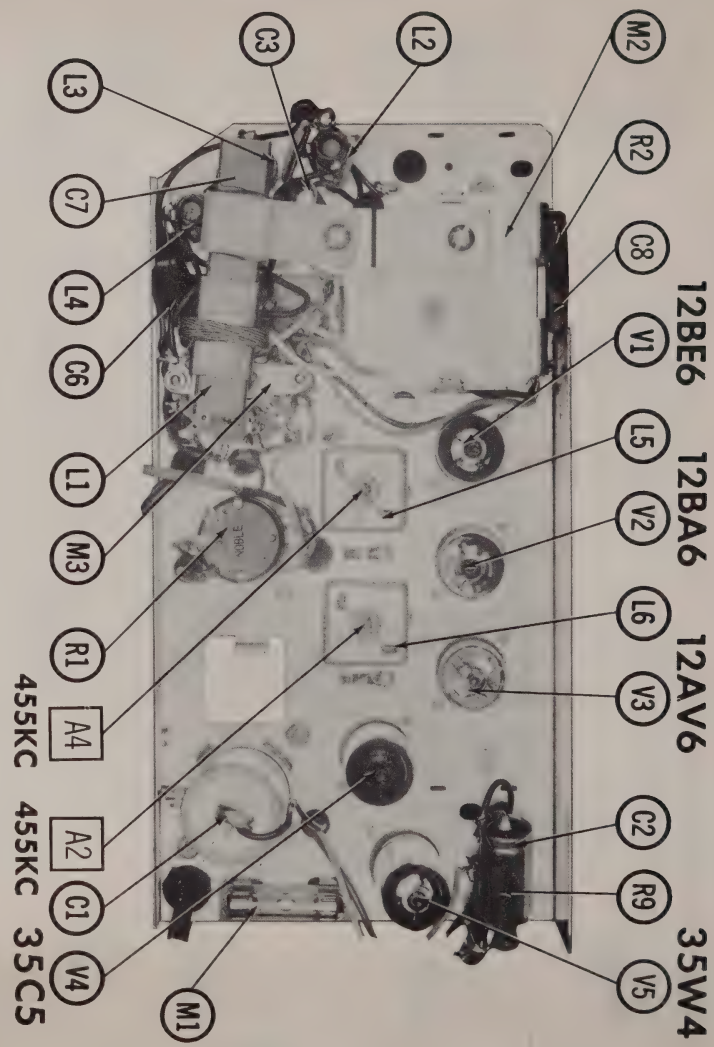
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HARPERS PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		AB-60				Volume
B	Shaft			AK-29				
C	Switch			KR-3				Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	100Ω			
R3	20K			
R4	100Ω			
R5	2meg			
R6	5meg			
R7	250K			
R8	500K			
R9	150Ω 1W			
R10	200Ω 1W			
R11	800Ω 1W			
R12	50Ω 1W			
R13	100Ω 2W			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		HARPERS PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick		BC-419	705-A		T532	
L2	SW Ant.						
L3	BC Osc.		BC-393	70-OSC	RTC-8647	T512	
L4	SW Osc.						
L5	Input IF		BC-352	12-C1	RTC-8632	T607	
L6	Output IF		BC-353	12-C2	RTC-8633	T608	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	HARPERS PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3000Ω	6-8Ω			A-2203①	22S86	S-63X	① Drill New Mounting Hole(s).

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HARPERS PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	10P-4A	4A07Z8	

FUSES

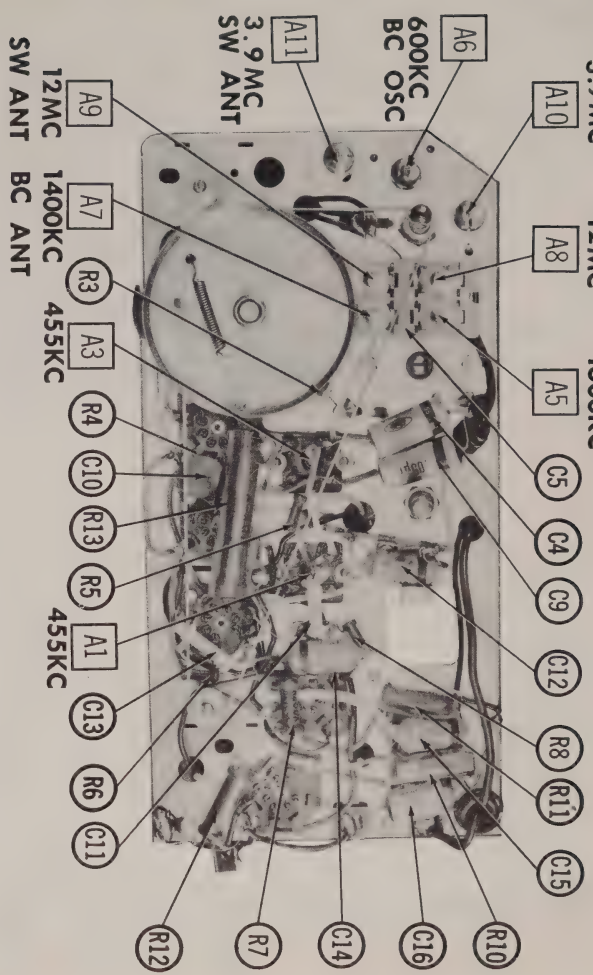
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			HARPERS PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1/2A 250V			312.500 (½A 250V)	356001	AGC ½	4400

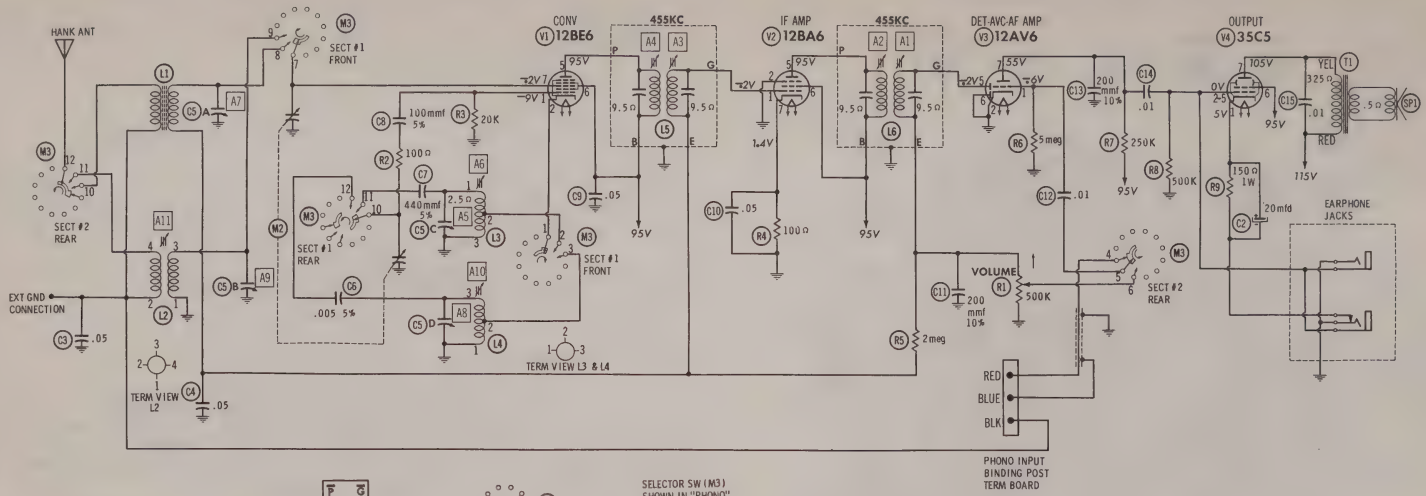
MISCELLANEOUS

ITEM No.	PART NAME	HARPERS PART No.	NOTES
M2	Tuning Cap.		2 Gang (Ant. 12-430mmf, Osc. 12-430mmf)
M3	Switch		Function Selector (Rotary Wafer Type)

DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



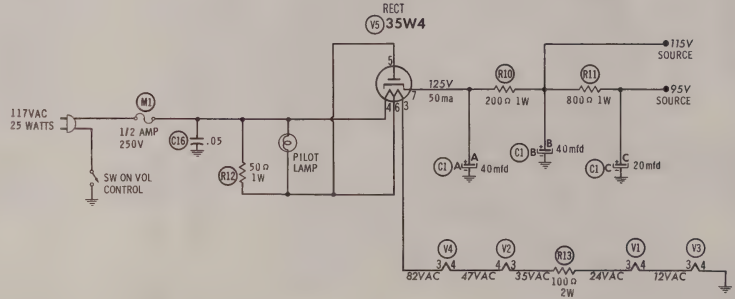


SELECTOR SW (M3) SHOWN IN "PHONO" POSITION
SW SEQUENCE
1. PHONO
2. BC
3. SW

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	20K	.2Ω	30Ω	15Ω	†1000Ω	†1000Ω	2.5meg
V2	12BA6	2.5meg	0Ω	130Ω	145Ω	†1000Ω	†1000Ω	100Ω
V3	12AV6	5meg	0Ω	15Ω	0Ω	500K	0Ω	†250K
V4	35C5	150Ω	500K	190Ω	145Ω	500K	†1000Ω	†525Ω
V5	35W4	NC	NC	190Ω	235Ω	235Ω	230Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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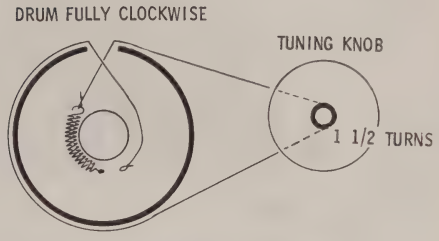
HARPERS MODEL UC-101

PHOTOFACT® Folder with CIRCUITRACE*

MAGNAVOX MODEL AM-80

MAGNAVOX MODEL AM-80

DRIVE CORD STRINGING



FRONT VIEW

MAGNAVOX MODEL AM-80

TRADE NAME	Magnavox Model AM-80
MANUFACTURER	The Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE	BROADCAST 535-1605KC
RATING	7 MA @ 9 Volts DC (No Signal, Min. Volume) 15 MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4 .... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537
A6, A7 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	535KC	Tuning gang fully closed	"	A4, A5	Adjust for maximum output. A5 is adjusted by moving antenna coil turns along ferrite core. Wax turns in place.
3.	"	1600KC	1600KC	"	A6, A7	Adjust for maximum output. Repeat steps 2 and 3.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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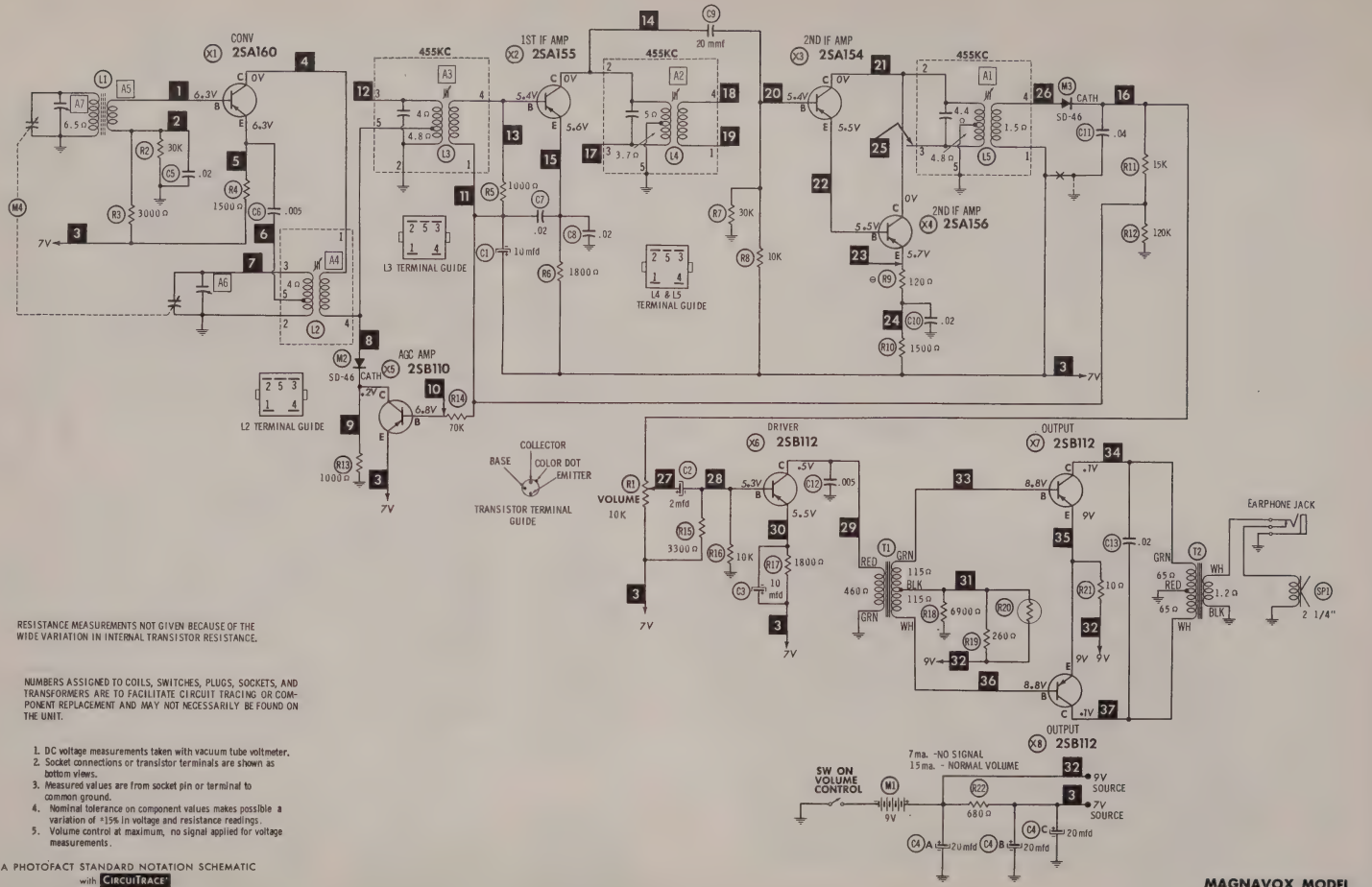
KF844

SET 559 FOLDER 10



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MAGNAVOX MODEL AM-80

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: RAYTHEON PART No.	NOTES
X1	2SA160	Converter	2N412		PNP
X2	2SA155	1st IF Amplifier	2N410		PNP
	2SA156 *	1st IF Amplifier			PNP * Alternate
	2SA154 *	1st IF Amplifier			PNP
X3	2SA154	2nd IF Amplifier	2N410		PNP
	2SA156 *	2nd IF Amplifier			PNP
X4	2SA156	2nd IF Amplifier	2N410		PNP
	2SA154 *	2nd IF Amplifier			PNP
X5	2SB110	AGC Clamper	2N406		PNP
X6	2SB112	Driver	2N406		PNP
X7	2SB112	Output	2N408		PNP
X8	2SB112	Output	2N408		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	3	270049-1	PTT6	NLW10-6	MT1-5	TT3X10	MLV10-3	TE-1053
C2	2	12	270051-1	PTT49	NLW2-50	MT1-1	TT12X2	MLV2-12	TE-1121
C3	10	3	270049-1	PTT6	NLW10-6	MT1-5	TT3X10	MLV10-3	TE-1053
C4A	20	10	270056-1						
B	20	10							
C	20	10							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C6	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C7	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C8	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C9	20		NPO-SI 20	TCZ-20	L10Q2	CCTO-200	CNO-422	10TCC-Q20
C10	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C11	.04	#250340-1						
C12	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C13	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20

Magnavox Part Number

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	10K	1/4	220168-1					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

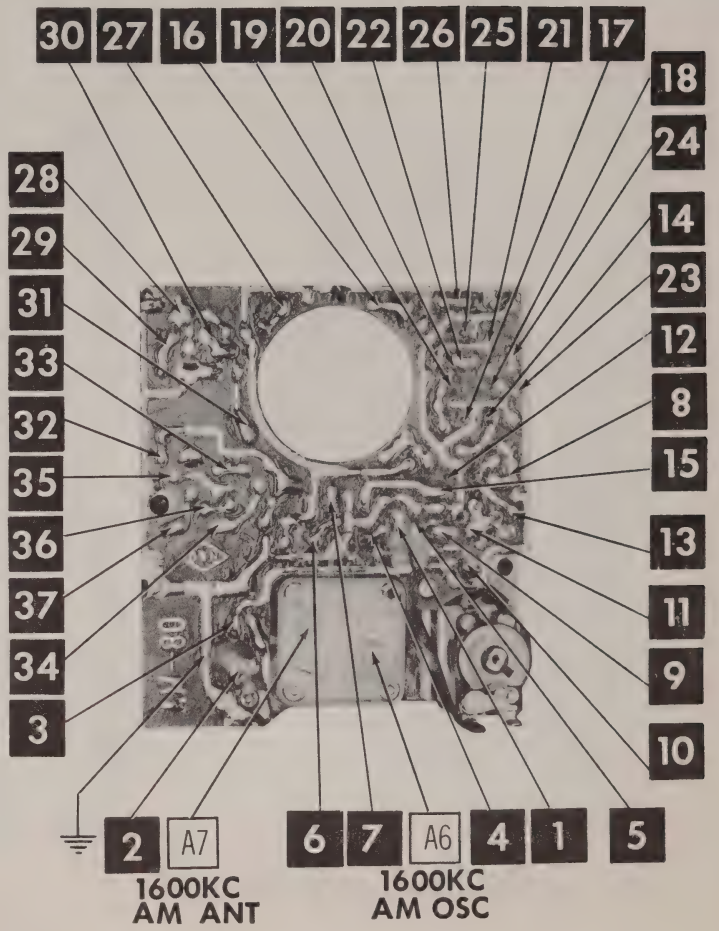
ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: WORKMAN TV PART No.	REMARKS
R2	30K			
R3	3000Ω			
R4	1500Ω			
R5	1000Ω			
R6	1800Ω			
R7	30K			
R8	10K			
R9	120Ω			Note 1
R10	1500Ω			
R11	15K			
R12	120K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: WORKMAN TV PART No.	REMARKS
R13	1000Ω			
R14	70K			
R15	3300Ω			
R16	10K			
R17	1800Ω			
R18	6900Ω			
R19	260Ω			
R20	Temp. Comp.			Pt. #230132-1
R21	10Ω			
R22	680Ω			

Note 1. Value will vary (0-120Ω) depending on transistor characteristics.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MAGNAVOX PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	360871-1					
L2	Osc.	360872-1					
L3	1st IF	360868-1					
L4	2nd IF	360869-1					
L5	3rd IF	360870-1					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	320091-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1400Ω CT	6-8Ω	320092-1					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω	580064-1		

BATTERIES

ITEM No.	VOLTAGE	MAGNAVOX PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	530064-1		2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M2	SD-46	530063-1		1N60	AGC (Pigtail)
M3	SD-46	530063-1		1N60	Detector (Pigtail)

MISCELLANEOUS

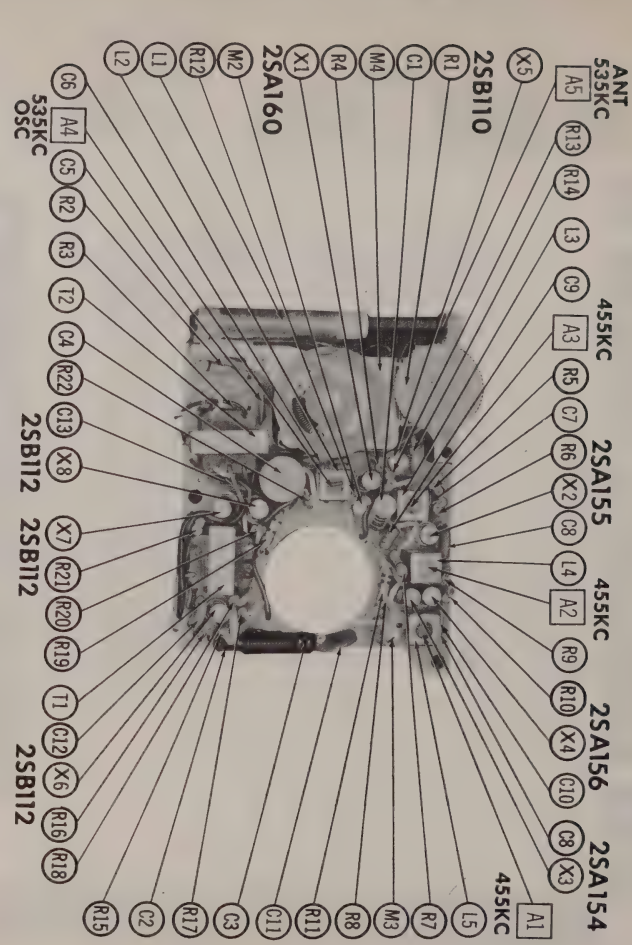
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Tuning Cap.	260159-1	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Indicator	140476-1	
Knob	140473-1	Tuning, Black
Knob	140473-2	Tuning, Turquoise
Knob	140474-1	Volume, Black
Knob	140474-2	Volume, Turquoise
Cabinet Back	140472-1	Black
Cabinet Front	140471-1	Black
Cabinet Back	140472-2	Turquoise
Cabinet Front	140471-2	Turquoise
Leather Case	400312-1	
Earphone Case	400313-1	
Carrying Strap	400317-2	

CHASSIS—TOP VIEW

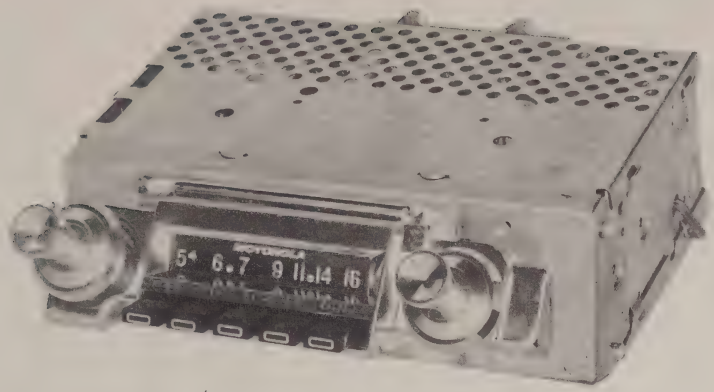


WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder

MOTOROLA MODEL CTA61



TRADE NAME	Motorola Model CTA61 (For 1961 Chevrolet)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built Transistorized Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	540 — 1610KC RATING .6 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A9, A10, A11, A12... GENERAL CEMENT #9050-L, 9150
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400% Mod.)	High end stop.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6, A7, A8	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A9, A10, A11, A12) out of coils. Repeat Step 2.					
3.	Thru dummy to antenna receptacle.	1200KC	Tuner carriage 9/32" from high end stop.	Across voice coil	A9, A10, A11, A12	Adjust for maximum output. Repeat Steps 2 and 3.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1200KC and adjust A8 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull pushbutton out, then press in firmly.
3. Repeat for remaining pushbuttons.

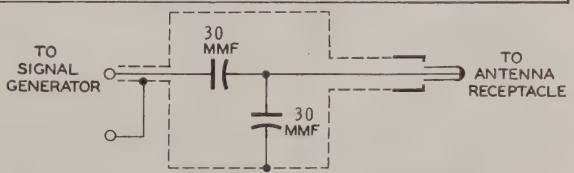


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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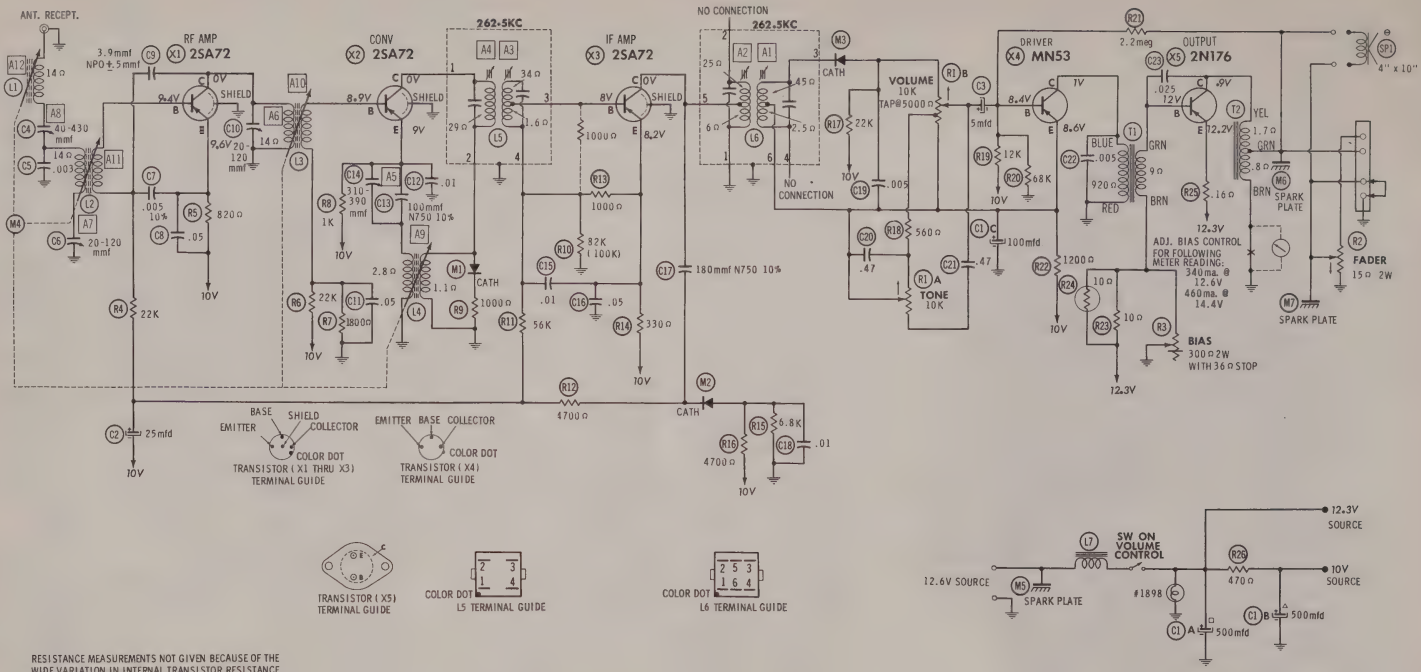
KD915

MOTOROLA MODEL CTA61
MOTOROLA MODEL CTA61
SET 559 FOLDER 11



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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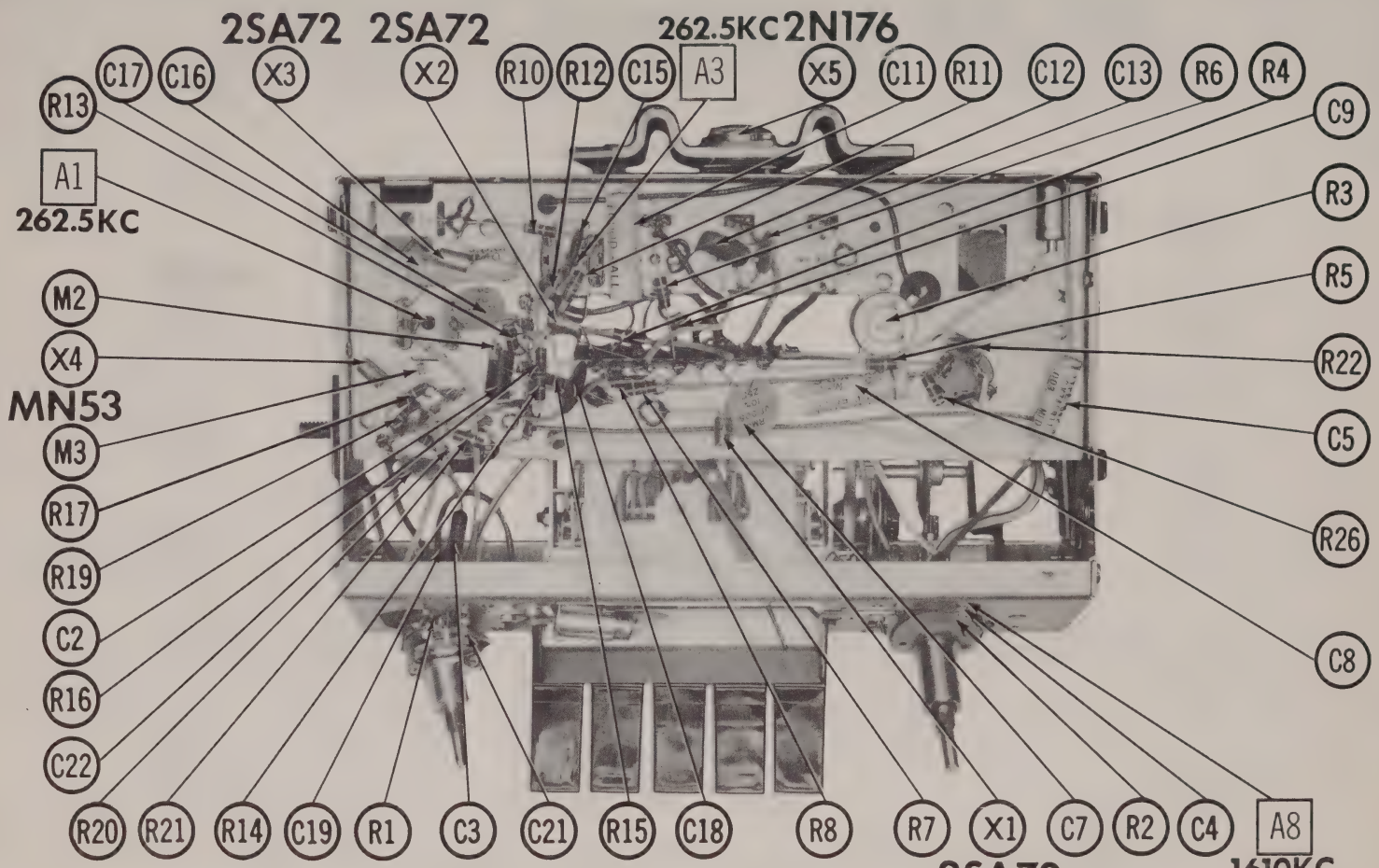
MOTOROLA MODEL CTA61



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2SA72	RF Amplifier	2N1637		PNP
X2	2SA72	Converter	2N1639		PNP
X3	2SA72	IF Amplifier	2N1638		PNP
X4	MN53	Driver	2N591	2N362	PNP
	4450*	Driver			PNP
X5	2N176	Output	2N176		PNP Note 1

Note 1. When replacing, apply DC-4 grease (Part #11M490487) to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

* Alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	■500	16	23B543279	AFH3-00-95	C0005	XC3-48	WP300.85		TVLS-3026.8*
B	▲500	16							
C	100	16							
C2	25	3	23K544540	PTT9	NLW25-3	MT1-10	TT3X25	MLV25-3	TE-1055
C3	5	3	23K544541	PTT4	NLW5-15	MT1-3	TT6X5	MLV5-3	TE-1052.2

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	40-430	#20A64855A01						
C5	.003 200V		P288N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D30
C6	20-120	#20K541014				424		
C7	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C8	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C9	3.9 NPO ±.5mmf				C10V4C			10TCC-V39
C10	20-120	#20K541014				424		
C11	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C12	.01 100V		P288N-01	D6-103	CUB4S1	1DP-1-103	GEM-411	4TM-S10
C13	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C14	310-390	#20K541700						
C15	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C17	180 N750 10%			TCN-180	C10T18U		CN7-318	10TCU-T18
C18	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C20	.47mfd 3V			UK-474				HY-130
C21	.47mfd 3V			UK-474				HY-130
C22	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	.025				BPMS6S25	4DP-2-253	GEM-4125	5HK-S25

\# Motorola Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	10K	Linear	18B64870A01				■ UE4260S	Tone
B	10K							Volume
	5000Ω Tap							
C	Switch							Power Off-On
R2	15Ω	2(WW)	18B64869A01					Fader
R3	300Ω	2(WW)	18K543493		39-300 *	112-300 ■	FL-500 ■	Bias
	36Ω Stop							

* Use 39Ω, 2W Resistor in series with terminal.

■ "STA-LOC" equivalent: FE14L, RU14T53, OS812, IS1312, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	22K				R16	4700Ω			
R5	820Ω				R17	22K			
R6	22K				R18	560Ω			
R7	1800Ω				R19	12K			
R8	1000Ω				R20	68K			
R9	1000Ω				R21	2.2meg			
R10	82K			(100K) *	R22	1200Ω			
R11	56K				R23	10Ω			
R12	4700Ω				R24	10Ω			Pt. #6K543800
R13	1000Ω				R25	.16Ω			Pt. #17A64856A01
R14	330Ω				R26	470Ω			
R15	6800Ω								

* Alternate Value.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant.	24K543896 ①					① Part of M4
L2	Ant.	24B40431A02 ①					
L3	RF	24B40431A01 ①					
L4	Osc.	24B40430A01 ①					
L5	Input IF	24B64861A01					
L6	Output IF	24B64861A02					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L7	.6A	.4Ω	.010HY	25B543338					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	25K543841					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	40Ω Tap ⓐ 3-4Ω	25K544271					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"x 10"	PM	3-4Ω	50C64850A03*	410A2	* Alternate Part #50C64850A01

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M1		48K544539		1N295	Limiter (Pigtail)
M2		48K544539		1N295	AGC (Pigtail)
M3		48K544539		1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuner	77D40442A01	(AT-348) Complete
M5	Spark Plate	64K530177	
M6	Spark Plate	64K561877	
M7	Spark Plate	64K561877	

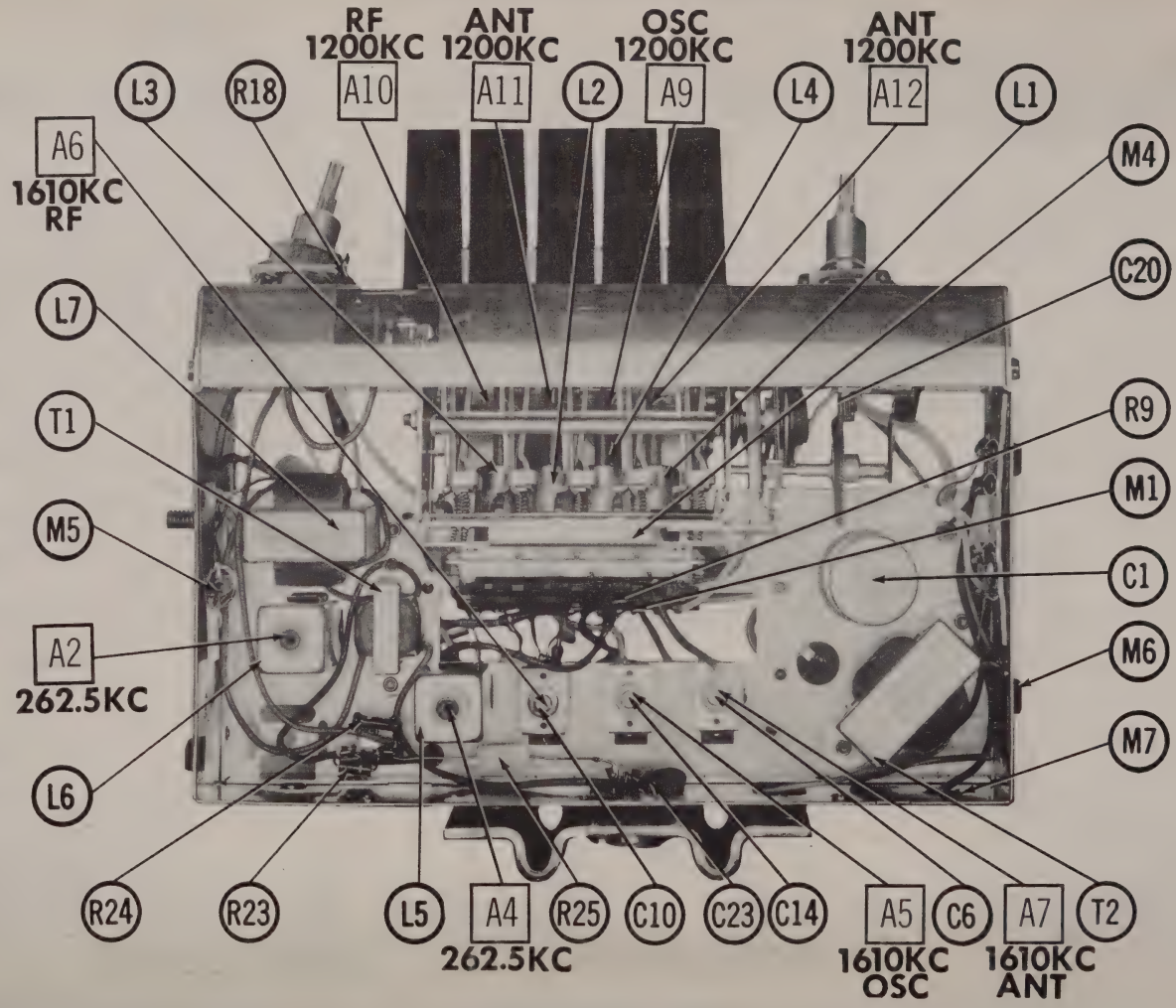
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Scale	34B64857A01	
Dial Pointer	1B40460A01	
Knob	36B64859A01	Tuning, Volume
Knob	36B64866A01	Tone, Speaker
Pushbutton	38C40438A02	Numbers 1, 3, 5
Pushbutton	38C40438A01	Numbers 2, 4

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



CHASSIS TOP VIEW

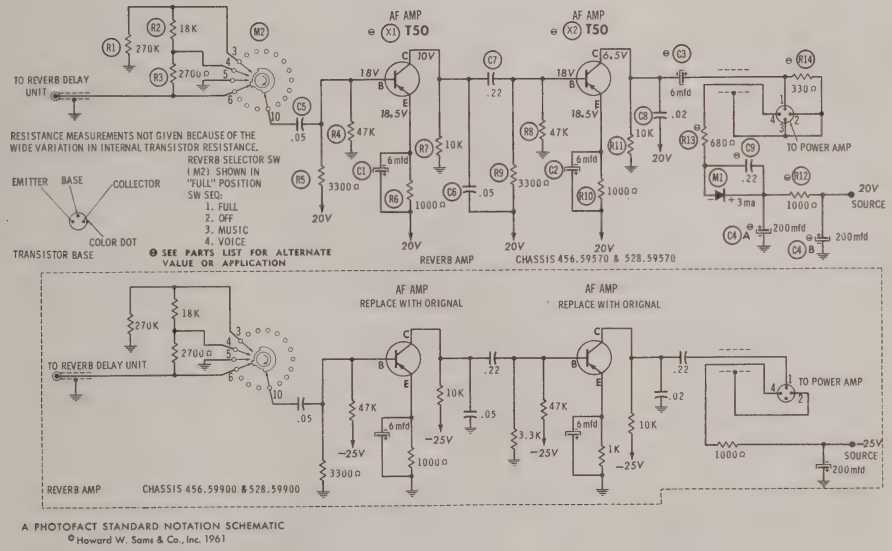
PHOTOFACT® Folder

SILVERTONE MODELS
9612, 9613, PC-9612, PC-9613
(Ch. 456/528.59570, 456/528.59900)

MODEL 9613

TRADE NAME	Silvertone Models 9612, PC-9612 (Ch. 456.59570, 528.59570) 9613, PC-9613 (Ch. 456.59900, 528.59900)
SUPPLIER	Sears Roebuck & Co., S. Homan Ave., Chicago, Illinois
TYPE SET	Two Transistor Reverberation Unit
POWER SUPPLY	Models 9612, PC-9612: Externally Powered Models 9613, PC-9613: 24 Volts AC, 60 Cycles (.010 Amp. @ 24 Volts AC)

SILVERTONE MODELS
9612, 9613, PC-9612, PC-9613
(Ch. 456/528.59570, 456/528.59900)



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PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	T50	AF Amplifier	2N217		PNP
	T77*	AF Amplifier			PNP
	T23†	AF Amplifier			PNP
X2	T50	AF Amplifier	2N217		PNP
	T77*	AF Amplifier			PNP
	T23†	AF Amplifier			PNP

* Alternate type for Chassis 456.59900, 528.59900.
† Used in Chassis 456.59570, 528.59570.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	6	15	18-27-5	PTT64	NLW6-15	MT1-5	TT25X6	MLV5-15	TE-1153
C2	6	15	18-27-5	PTT64	NLW6-15	MT1-5	TT25X6	MLV5-15	TE-1153
C3	6	15	18-27-5 ①	PTT64	NLW6-15	MT1-5	TT25X6	MLV5-15	TE-1153
C4A	200	25	18-131-5 ②						
B	200	25	②						

Note 1. Chassis 456.59570 and 528.59570 use .22mfd in this application.
Note 2. Chassis 456.59570 and 528.59570 omit C4B (C4 Part #18-130-5).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.05		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C6	.05		BPD-05	DD-503	H-05S5		GP150	5HK-S50
C7	.22 50V		P288N-22		CUB2P22	IDP-3-224	GEM-2022	2TM-P22
C8	.02		BPD-02	DD-203	BYA10S20	CCD-203	B-120	5HK-S20
C9	.22 50V	Note 1	P288N-22		CUB2P22	IDP-3-224	GEM-2022	2TM-P22

Note 1. Not used in Chassis 456.59570 and 528.59570.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

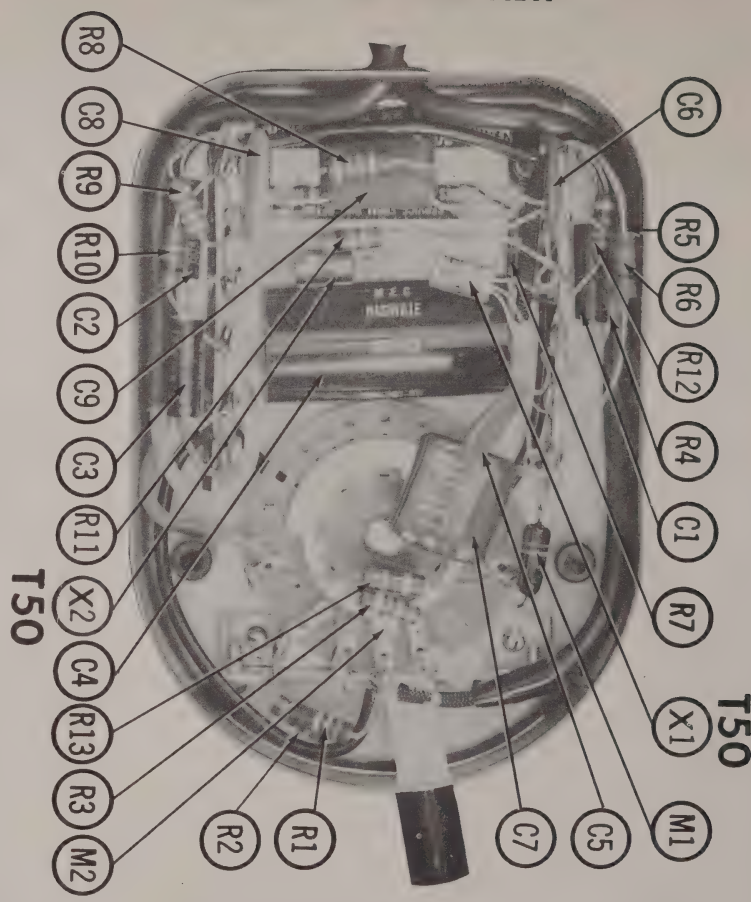
ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	270K				R8	47K			
R2	18K				R9	3300Ω			
R3	2700Ω				R10	1000Ω			
R4	47K				R11	10K			
R5	3300Ω				R12	1000Ω			Note 1
R6	1000Ω				R13	680Ω			Note 1
R7	10K				R14	330Ω			Note 2

Note 1. Not used in Chassis 456.59570, 528.59570.
Note 2. Chassis 456.59900, 528.59900 may use 180Ω in this application.
Not used in Chassis 456.59570, 528.59570.

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	SILVERTONE PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.003A	*			* Silicon. Not used in Chassis 456.59570, 528.59570.

CHASSIS—BOTTOM VIEW



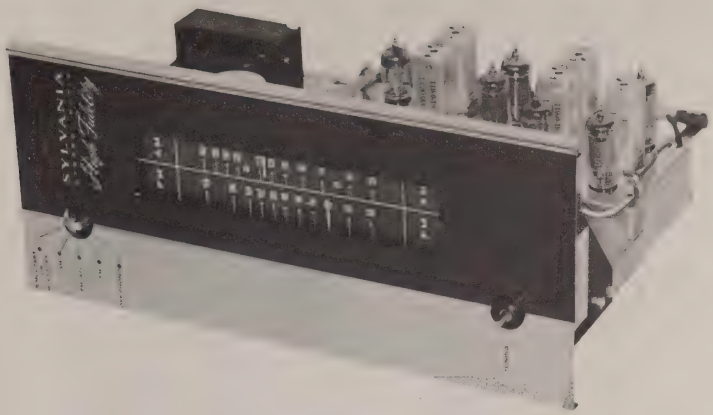
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M2	Switch	69-358-0	Selector (Rotary Wafer Type) Includes Voice-Music-Off- & Full
M3	Reverberation Unit	23-12-2	Complete

PHOTOFACT® Folder with CIRCUITRACE®

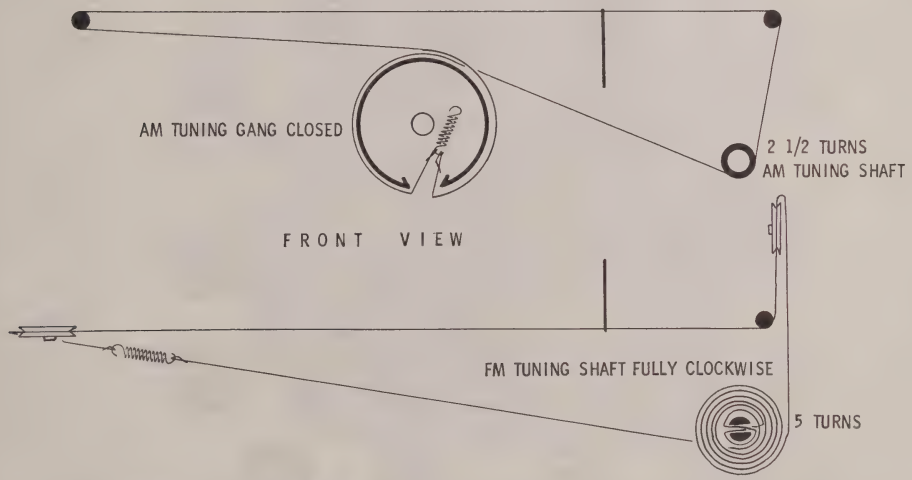
**SYLVANIA MODEL
T21 (Ch. 671-1)**

SYLVANIA MODEL
T21 (Ch. 671-1)



TRADE NAME	Sylvania Model T21 (Ch. 671-1)		
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N. Y.		
TYPE SET	AC Operated 7 Tube FM-AM Tuner		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	30 Watts, .35 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1600KC	FREQ. MOD.	88 – 108MC

DIAL CORD STRINGING



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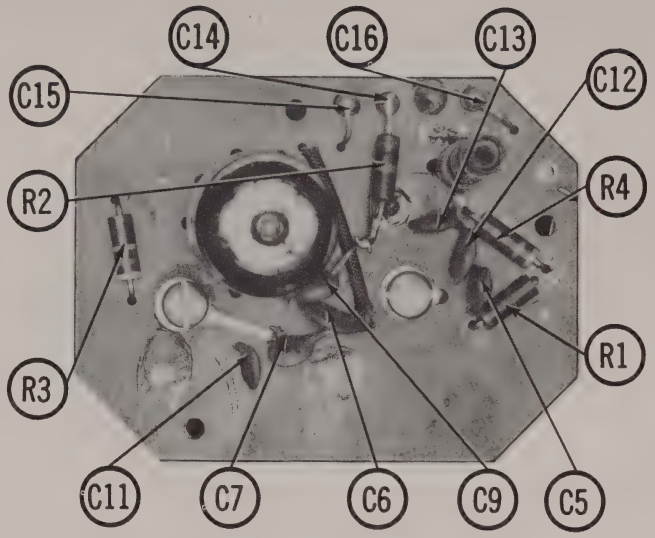
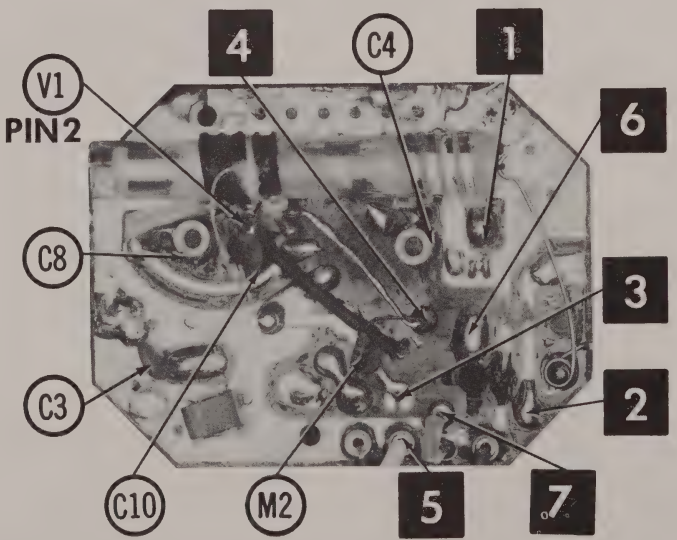
KL835

SET 559 FOLDER 13



PRINTED BOARD-TOP VIEW



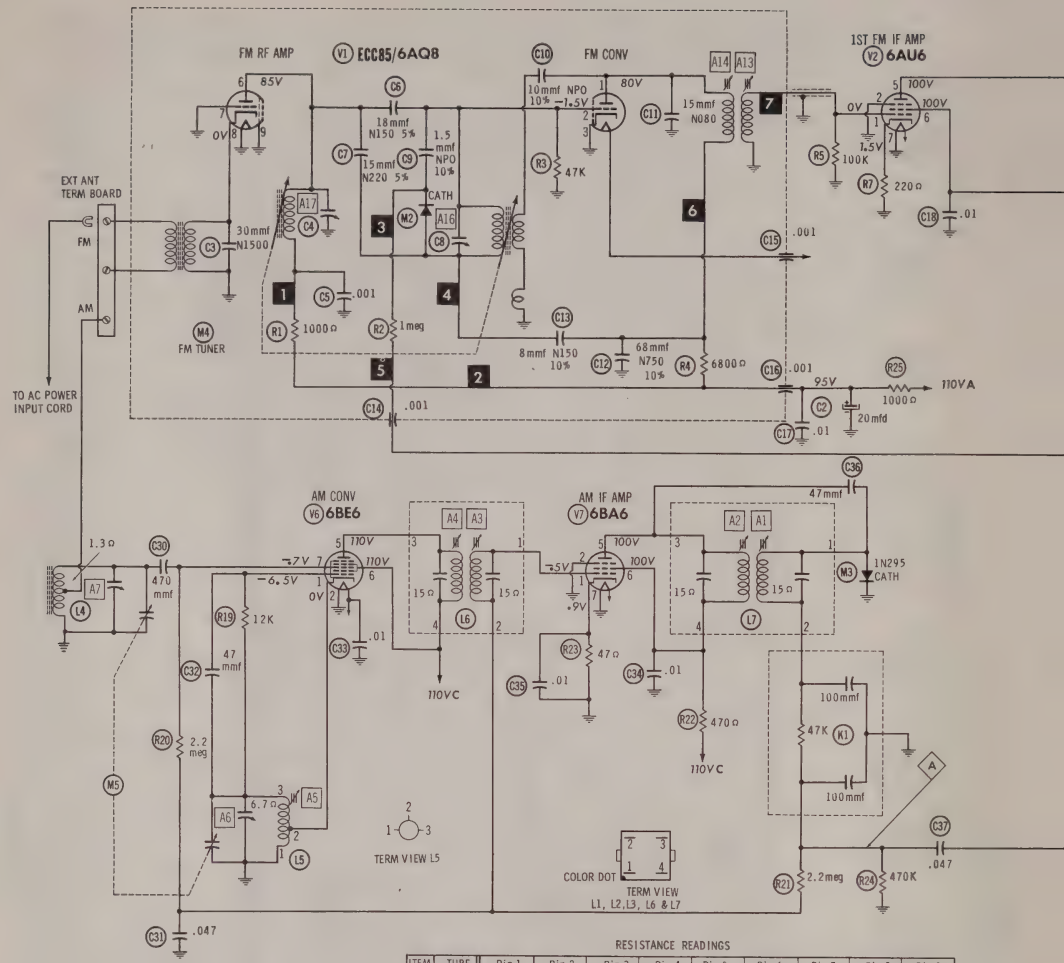
A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

CHASSIS-BOTTOM VIEW

SYLVANIA MODEL
T21 (Ch. 671-1)

FOLDER 13



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†7000Ω	47K	0Ω	FIL	FIL	†2400Ω	0Ω	.1Ω	0Ω
V2	6AU6	.1Ω	0Ω	FIL	FIL	†1400Ω	†1400Ω	220Ω		
V3	6BA6	.1Ω	0Ω	FIL	FIL	†1400Ω	†1400Ω	220Ω		
V4	6AU6	100K	0Ω	FIL	FIL	†10K	†10K	0Ω		
V5	6AL5	200K	100K	FIL	FIL	0Ω	0Ω	100K		
V6	6BE6	12K	.8Ω	FIL	FIL	†390Ω	†390Ω	5meg		
V7	6BA6	2.5meg	0Ω	FIL	FIL	†860Ω	†850Ω	47Ω		

ALL MEASUREMENTS MADE IN "SIMULCAST" POSITION.
† MEASURED FROM OUTPUT OF M1.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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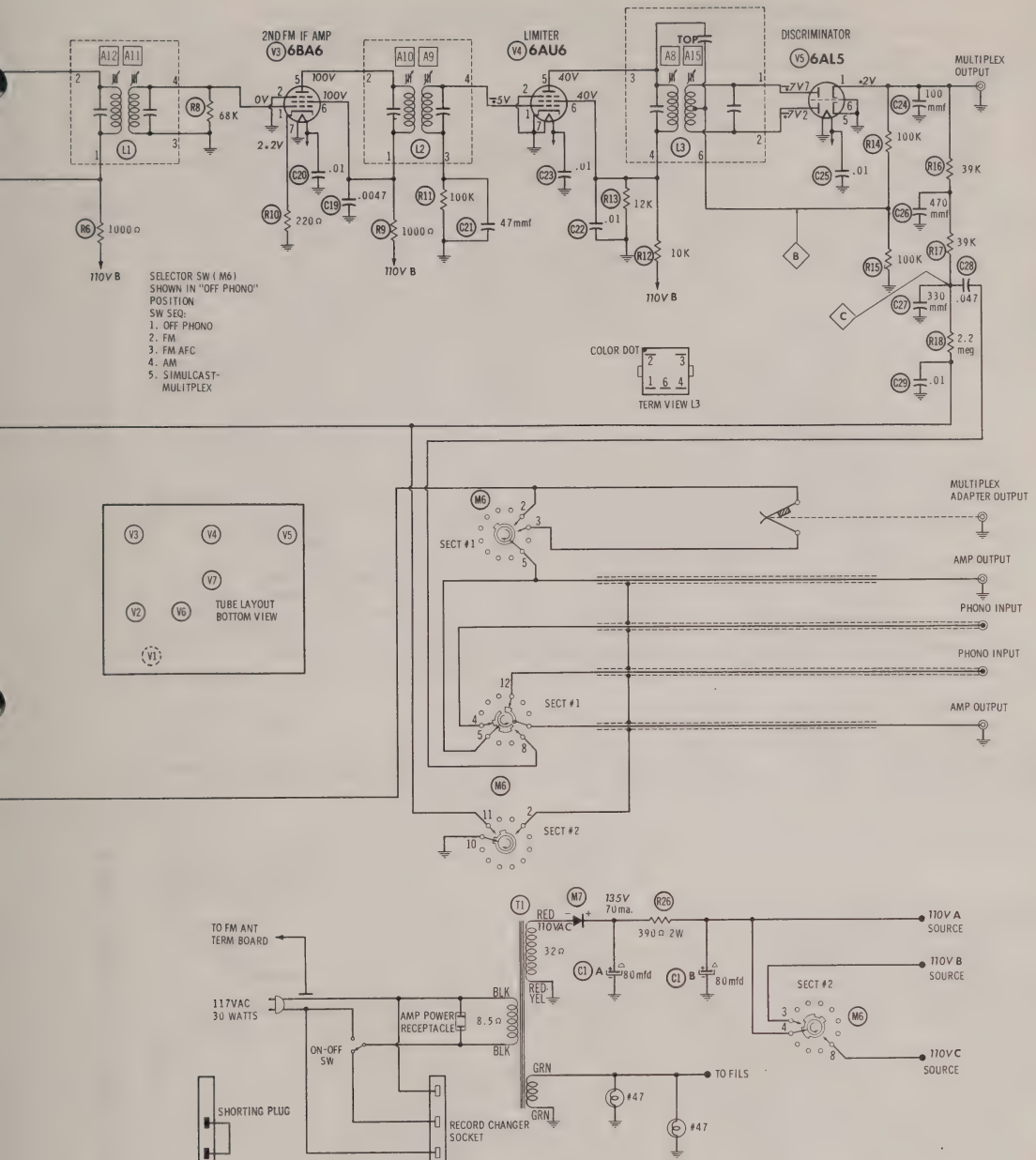


SYLVANIA MODEL T21 (Ch. 671-1)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools:

A1 thru A4, A8 thru A12 and A15...GENERAL CEMENT #5097, 8727
WALSCO #2515

A5.....GENERAL CEMENT #8721, 3722
WALSCO #2519

A6, A7, A16, A17.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

A13, A14.....GENERAL CEMENT #9440

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side to AM antenna terminal. Low side to chassis.	455KC (400~ 30% AM)	(AM) Tuning gang fully open.	AC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	600KC	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver.
3.	"	1400KC	1400KC	"	A6, A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side to FM antenna terminal. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe thru 1meg to point (B). Common to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (C). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side to FM antenna terminal. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. thru 47K to point (B). Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC	(FM) 108MC	DC probe thru 1meg to point (B). Common to chassis.	A16	Adjust for maximum deflection.
7.	"	88MC	88MC Signal.	"	A17	"

FIG. 1

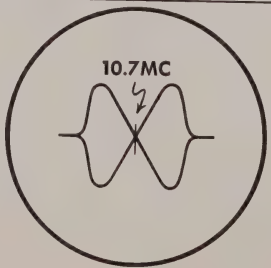


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85/6AQ8
V2	1st FM IF Amplifier	6AU6
V3	2nd FM IF Amplifier	6BA6
V4	FM Limiter	6AU6

ITEM No.	USE	TYPE
V5	Discriminator	6AL5
V6	AM Converter	6BE6
V7	AM IF Amplifier	6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲80	200	161-2027	AFH2-34	B0270	XC2-34	FP217.9	TMD-2330	TVL-2585
B	▲80	200							
C2	20	150		PRS1440	BBR20-150	QT1-9	TC45	TD-20-150	TVA-1410

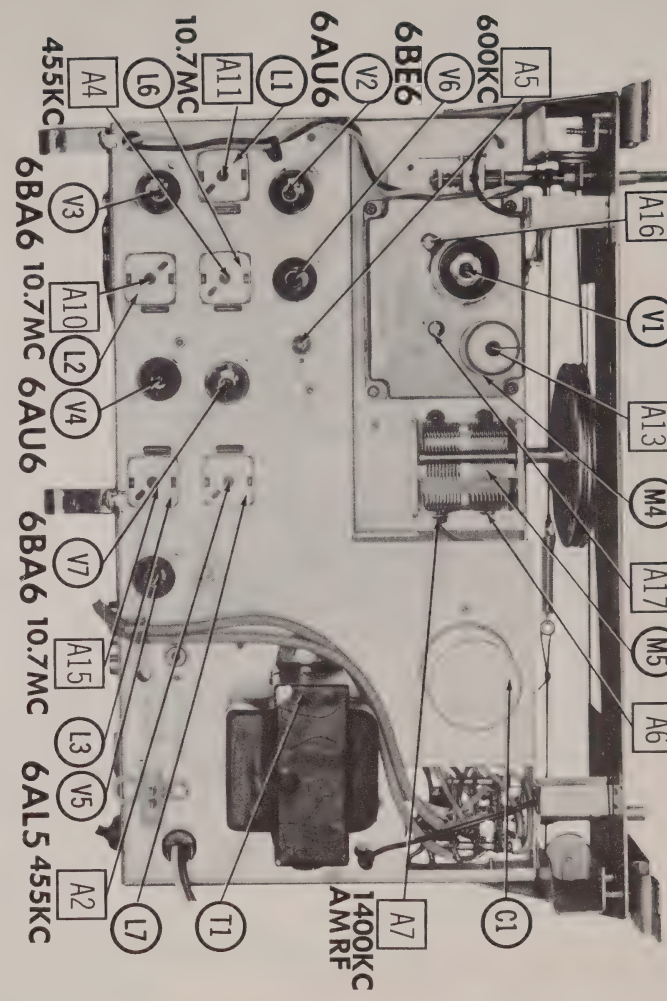
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	30 N1500			TCA-33		*		
C4								
C5	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	18 N150 5%					*		10TCP-Q18
C7	15 N220 5%					*		10TCR-Q15
C8								
C9	1.5 NPO 10%		NPO-DI 1.5	DTZ-1R5	C10V15C		CNO-515	10TCC-V15
C10	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C11	15 N080					*		
C12	68 N750 10%		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C13	8 N150 10%					*		10TCP-V82
C14	.001		EF-001	MFT-1000		CCF-102	CT280A	
C15	.001		EF-001	MFT-1000		CCF-102	CT280A	
C16	.001		EF-001	MFT-1000		CCF-102	CT280A	
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	100		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C25	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C27	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C28	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C29	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C31	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C32	47		DI-47	DD-471	L10Q47	CCD-470	GP447	10TS-Q47
C33	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C37	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	1000Ω			
R2	1meg			
R3	47K			
R4	6800Ω			
R5	100K			
R6	1000Ω			
R7	220Ω			
R8	68K			
R9	1000Ω			
R10	220Ω			
R11	100K			
R12	10K			
R13	12K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R14	100K			
R15	100K			
R16	39K			
R17	39K			
R18	2.2meg			
R19	12K			
R20	2.2meg			
R21	2.2meg			
R22	470Ω			
R23	47Ω			
R24	470K			
R25	1000Ω			
R26	390Ω 2W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	AM Diode Filter	100mmf, 100mmf, 47K	190-0044	Aerovox PA-97 Centralab PC-50 Sprague D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	2nd FM IF	122-0044	FM-254	1463	RTC-8599	T633	
L2	3rd FM IF	122-0044	FM-254	1463	RTC-8599	T633	
L3	Discriminator	128-0021	FM-253	1464	RTC-8665	T634	
L4	Loopstick	581-0031	BC-419	705-A		T532	
L5	AM Osc.	113-0088	BC-393	70-OSC	RTC-8647	T512	
L6	1st AM IF	121-0118	BC-352	12-C1	RTC-8632	T607	
L7	2nd AM IF	121-0118	BC-353	12-C2	RTC-8633	T608	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .35A	110V @ .070A	6.3V @ 2.5A	141-0091					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	SYLVANIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.070A	517-0025 †	1N1763 ♦	100 †	† Selenium ♦ Silicon

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M2	1N295	1N295		1N295	AFC (Part of FM Tuner)
M3					Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M4	FM Tuner	170-0058	Complete
M5	Tuning Cap.	170-0057	2 Gang (Ant. 15—290mmf, Osc. 17—150mmf)
M6	Switch	573-0029	Function Selector (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	721-0047	
Dial Pointer	792-0033	
Knob	740-0432	Tuning
Knob	740-0433	Function

WIRING DATA

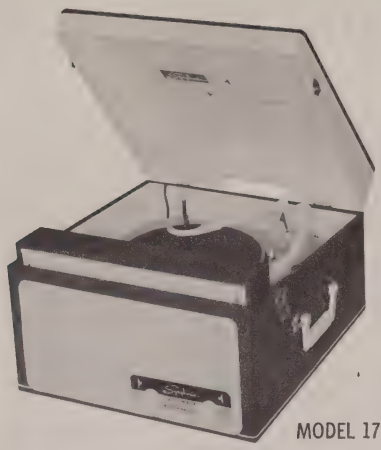
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

SYMPHONIC
MODELS 1717, 1794

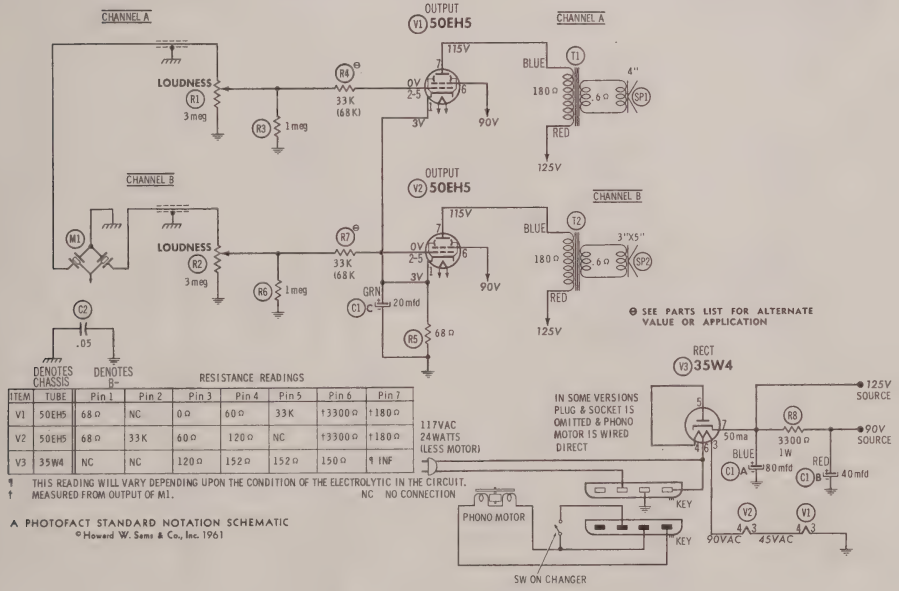
SYMPHONIC
MODELS 1717, 1794



MODEL 1717

TRADE NAME	Symphonic Models 1717, 1799
MANUFACTURER	Symphonic Radio & Electronic Corp., 235 Jersey Ave., New Brunswick, N. J.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles RATING 24 Watts, .22 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR TELEFUNKEN TW560 — PHOTOFACT SET 371 FOLDER 12 OR RECORD CHANGER MANUAL RC-10



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	50EH5	68Ω	NC	0Ω	60Ω	33K	†3300Ω	†180Ω
V2	50EH5	68Ω	33K	60Ω	120Ω	NC	†3300Ω	†180Ω
V3	35W4	NC	NC	120Ω	152Ω	152Ω	150Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

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SYMPHONIC
MODELS 1717, 1794

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KT744

SET 559 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •		• SYLVANIA •
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Output	50EH5	V3	Rectifier	35W4
V2	Channel B Output	50EH5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Symphonic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	80	150	CE-140	PRS4650	BBRT84215	TCT3117	TDLT-7	TVA-3437.1	
B	40	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-473	GEM-415	4TM-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Symphonic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3meg	½	VC-198	B-85	A47-3meg-Z	Q13-140	U57	Loudness, Channel A
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	3meg	½	VC-198	B-85	A47-3meg-Z	Q13-140	U57	Loudness, Channel B
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	1meg			(68K) *	R6	1meg			(68K) *
R4	33K				R7	33K			
R5	68Ω				R8	3300Ω 1W			

* Value used in Model 1794.

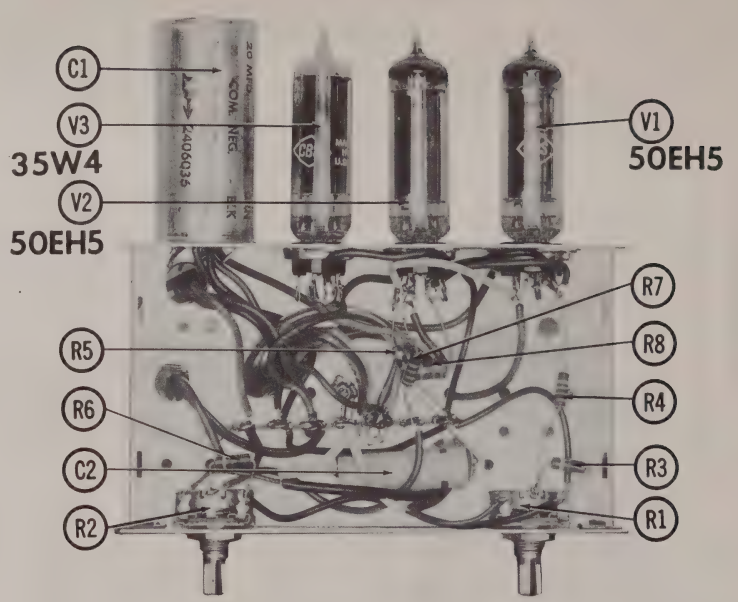
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Symphonic PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	19000Ω	3-4Ω	TR-146	A-3025	A-3332	24S53	S-12X	
T2	19000Ω	3-4Ω	TR-146	A-3025	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Symphonic PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SP-401	4A1	
SP2	3"x 5"	PM	3-4Ω	SP-424	35A05	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	Symphonic PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1			70TS	N8-7 * & N8-3 *	96T	Not Req.	12THA-S	N-12THA-S *	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KN392	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

SYMPHONIC MODEL 1718

SYMPHONIC
MODEL 1718

SYMPHONIC
MODEL 1718

TRADE NAME	Symphonic Model 1718
MANUFACTURER	Symphonic Radio & Electronic Corp., 235 Jersey Ave., New Brunswick, N. J.
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 27 Watts, .28 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR TELEFUNKEN TW560 – PHOTOFACT SET 371 FOLDER 12 OR RECORD CHANGER MANUAL RC-10

SET 559 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT718

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PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7A	V2 V3	Channel 1 Output Channel 2 Output	50EH5 50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYMPHONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	CE-101	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							
C2	100	25NP	CE-124	PRS7340	BR10015	TCN425		TVANS-1207.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C4	.05 400V		P488N-05	DD-503	CUB485	4DP-3-503	GEM-415	4TM-S50
C5	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C6	.004		BPD-004	DD-402	BYA10D4	CCD-402	B-240	5HK-D40
C7	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.004		BPD-004	DD-402	BYA10D4	CCD-402	B-240	5HK-D40
C9	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.05 400V		P488N-05	DD-503	CUB485	4DP-3-503	GEM-415	4TM-S50

CONTROLS

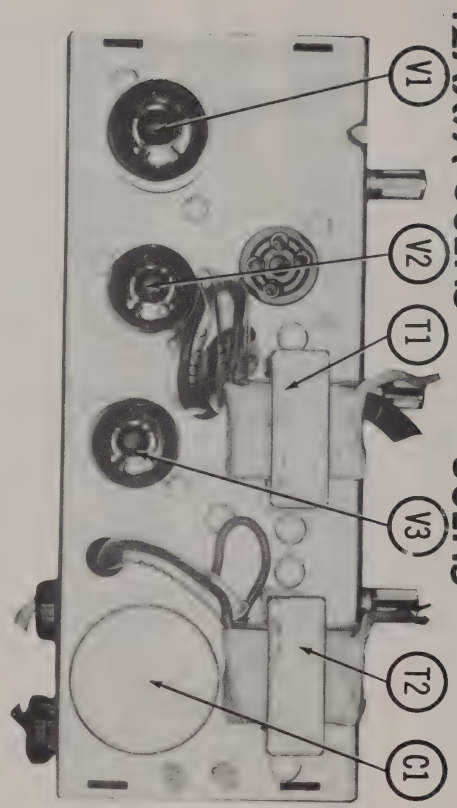
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYMPHONIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3meg	½	VC-269	B-85			FC36A	Loudness, Channel 2
B	3meg	½		SR-85			RU36A	Loudness, Channel 1
C	Shaft			Not Req.			CS3500	
R2A	4meg	½	VC-330	B-86	A47-4meg-S	B11-240	U67	Balance
B	Shaft			Not Req.	KSS-3	SK1	Not Req.	
R3A	500K	½	VC-270	B-60	AD47-500K-Z		FA55A	Tone
B	500K	½		SR-60	Not Req.		RU55A	Tone
C	Shaft			Not Req.	KSS-3		CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	100K				R9	82Ω			
R5	6.8meg				R10	2200Ω			
R6	82Ω				R11	100Ω 1W			
R7	100K				R12	22Ω 1W			
R8	6.8meg				R13	47Ω 2W			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYMPHONIC PART No.	REPLACEMENT DATA
K1	Audio Coupling	(2) 100mmf, (2) .01mfd, (2) 1000Ω, (2) 270K, (2) 470K	PC-3932-1	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SYMPHONIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	TR-199	A-3025①	A-3332①	26S58	S-12Z	
T2	2900Ω	3-4Ω	TR-199	A-3025①	A-3332①	26S58	S-12Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYMPHONIC PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	SP-603	5A1R	
SP2	6½"	PM	3-4Ω	SP-600	6A31	
SP3	5"	PM	3-4Ω	SP-603	5A1R	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	SYMPHONIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.060A	SR111♦	1N1763 *	100 ♦	SR200 *	♦ Selenium * Silicon

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	SYMPHONIC PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			76-TS-TB	N8-7 * & N8-3 *	96T	Not Req.	12TH-S	Not Req.	

CABINETS & CABINET PARTS

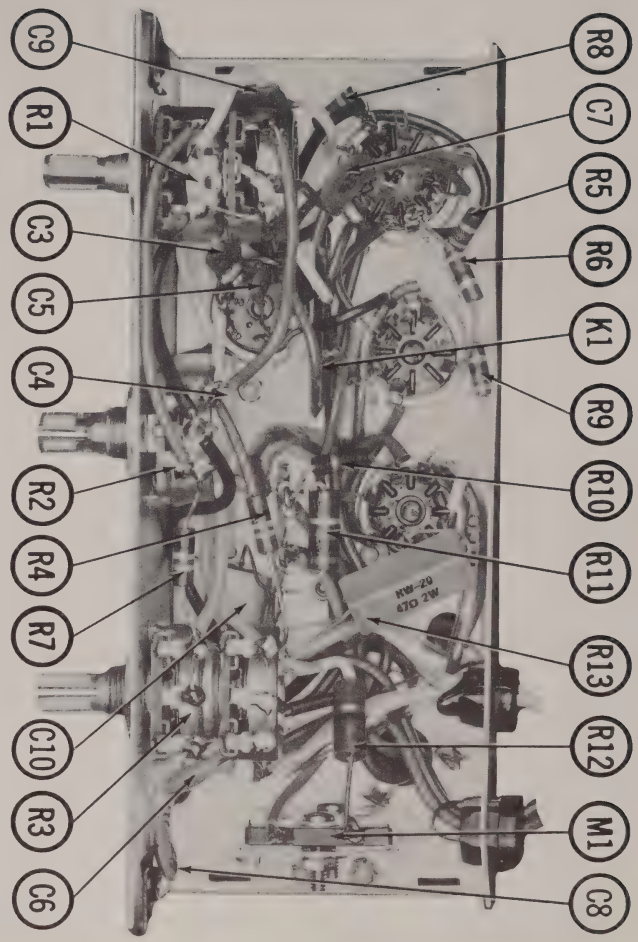
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

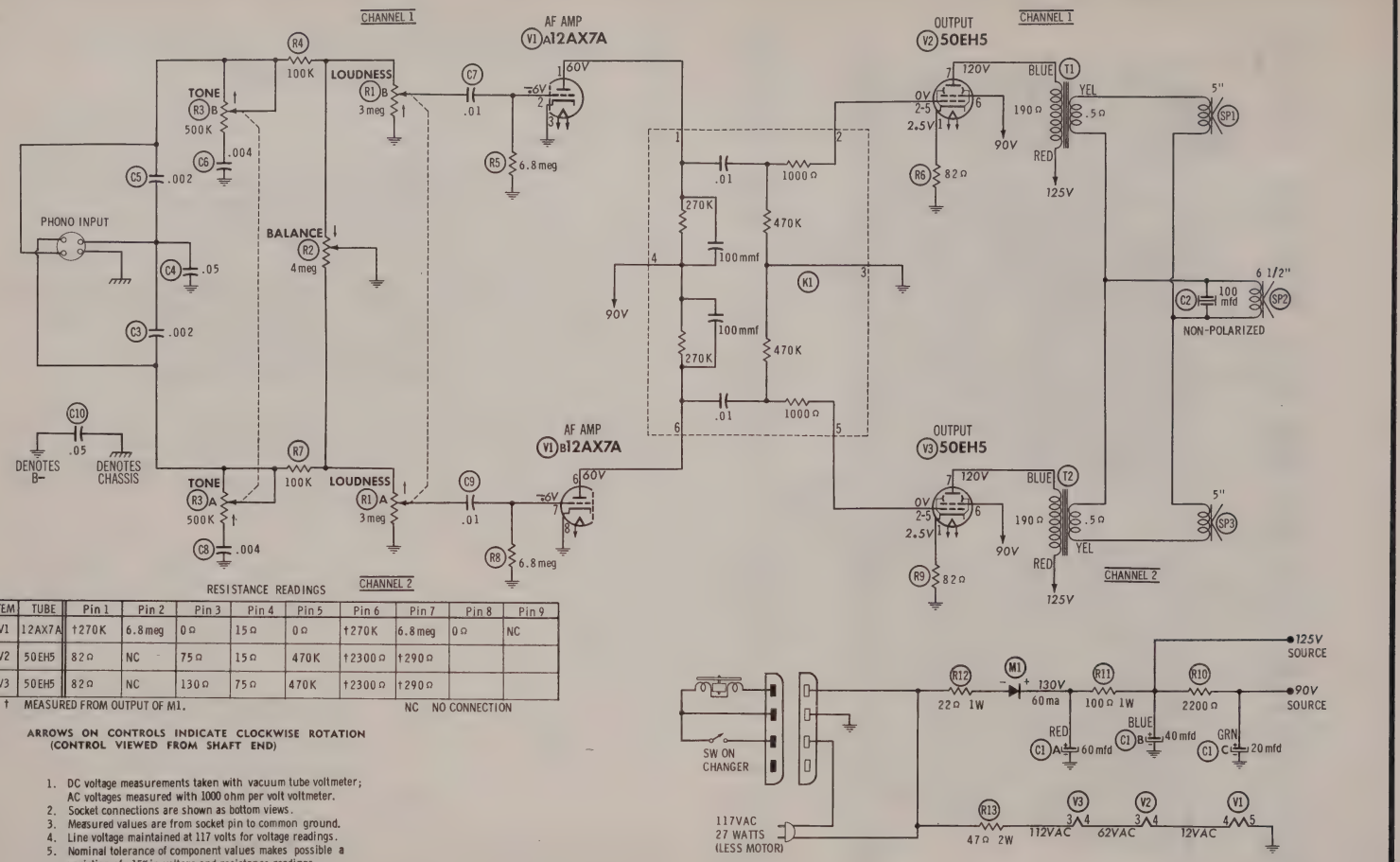
NAME	PART NO.	DESCRIPTION
Knob	KN-392	White

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†270K	6.8meg	0Ω	15Ω	0Ω	†270K	6.8meg	0Ω	NC
V2	50EH5	82Ω	NC	75Ω	15Ω	470K	†2300Ω	†290Ω		
V3	50EH5	82Ω	NC	130Ω	75Ω	470K	†2300Ω	†290Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SYMPHONIC MODEL 1718

PHOTOFACT® Folder with CIRCUITRACE®

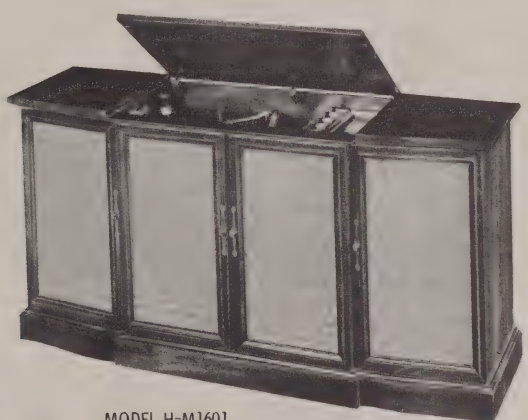
WESTINGHOUSE CHASSIS V-2510-5, V-2510-11, V-2511-4

WESTINGHOUSE CHASSIS
V-2510-5, V-2510-11, V-2511-4

MODEL H-M1513

TRADE NAME	Westinghouse	Models H-M1510, H-M1511, H-M1512, H-M1513 Chassis V-2511-4 (Tuner), V-2510-5 (Amplifier) Models H-M1600, H-M1601, H-M1602, H-M1603, H-M1604 Chassis V-2511-4 (Tuner), V-2510-11 (Amplifier)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.	
TYPE SET	AC Operated 9 Tube FM-AM Tuner, 7 Tube Stereo Amplifier and 4 Speed Automatic Record Changer (H-M1600 Series Has Reverberation Unit)	
POWER SUPPLY	105 — 120 Volts AC, 60 Cycles	
RATING	Model H-M1500 Series: 170 Watts, 1.5 Amp. @117 Volts AC Model H-M1600 Series: 150 Watts, 1.4 Amp. @117 Volts AC	
TUNING RANGE — BROADCAST	540 - 1600KC	FREQ. MOD. 88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #670V013H01 — SEE SIMILAR V-M 1571 — PHOTOFACT SET 527 FOLDER 14



MODEL H-M1601

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KN726, KN739

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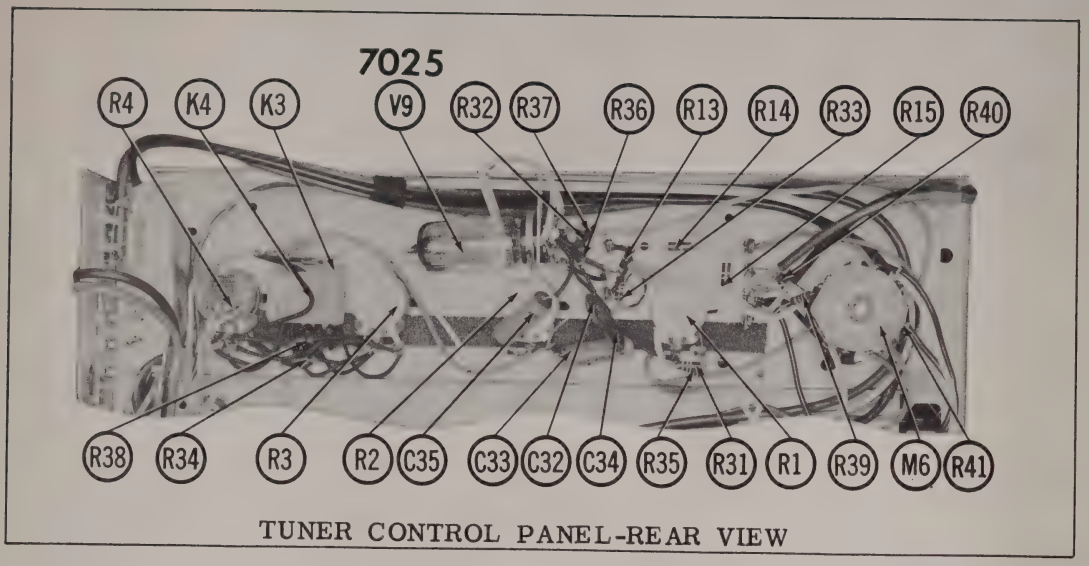
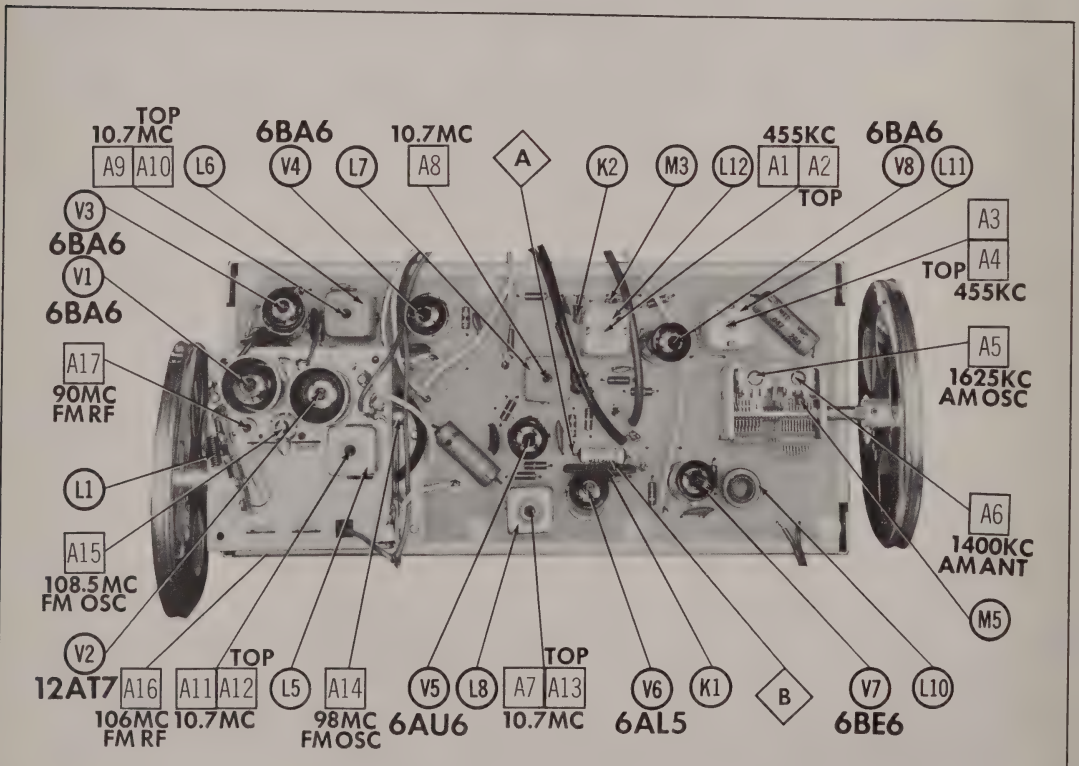
SET 559 FOLDER 16



TUNER CONTROL PANEL-REAR VIEW



TUNER CHASSIS TOP VIEW-ALIGN., INDUCTOR, TUBE & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A7 thru A14, A17... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A15, A16..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru 200mmf to antenna stator lug of AM tuning gang. Low side to chassis.	455KC (400~ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1625KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Place a thin insulated metal strip between the FM Mixer-Osc. tube and tube shield. Connect high side of generator to the metal strip. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (A). Common to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (B). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Place a thin insulated metal strip between FM Mixer-Osc. tube and tube shield. Connect high side of generator to the metal strip. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A7, A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C1. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C1.
5.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals thru matching network (Fig. 3).	98MC (Unmod.)	(FM) 98MC	DC probe to point (A). Common to chassis.	A14	Adjust for maximum deflection.
7.	"	108.5MC	High end stop.	"	A15	"
8.	"	87.5MC	Low end stop.	"	A14	Retouch for maximum deflection. Repeat Steps 7 and 8.
9.	"	106MC	106MC Signal.	"	A16	Adjust for maximum deflection.
10.	"	90MC	90MC Signal.	"	A17	"

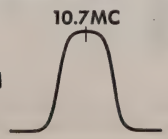


FIG. 1

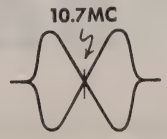


FIG. 2

Zo = Impedance of Cable

Zo	R1	R2
52Ω	56Ω	270Ω
72Ω	85Ω	220Ω

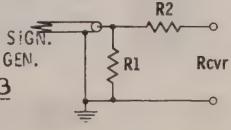
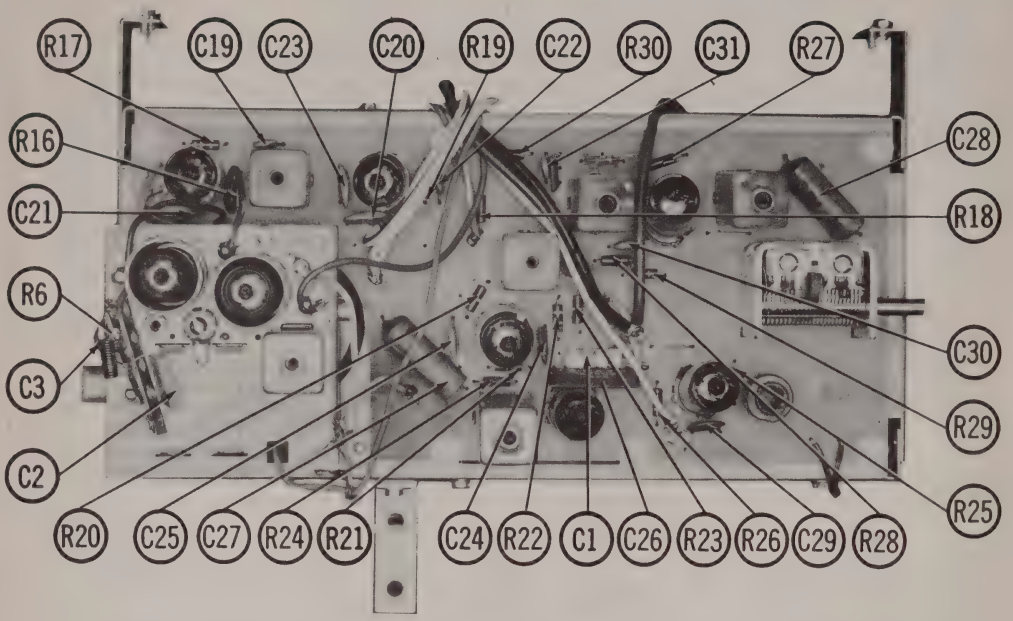
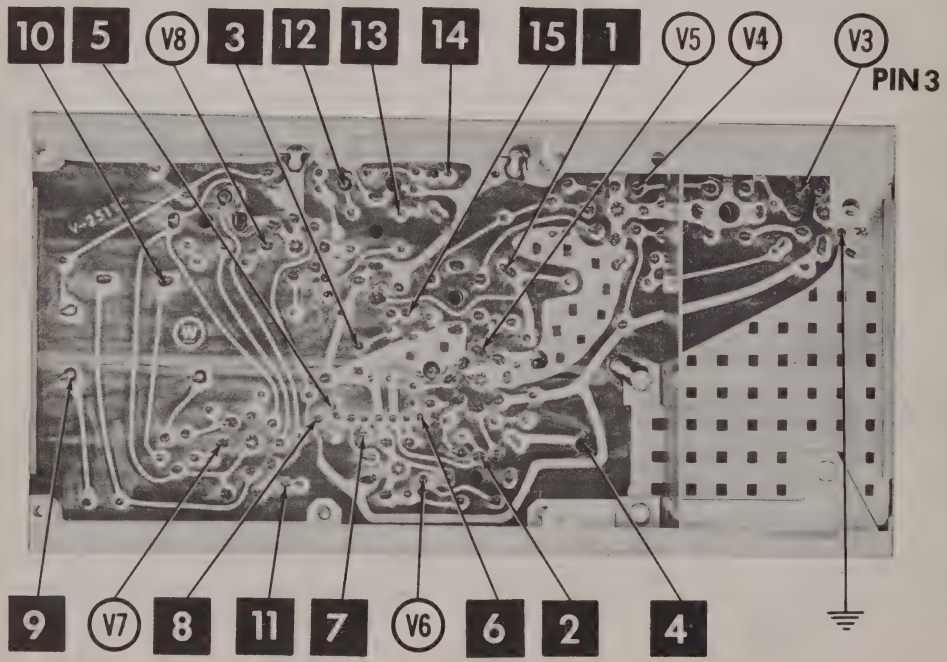


FIG. 3



TUNER CHASSIS TOP VIEW-CAPACITOR & RESISTOR IDENT.



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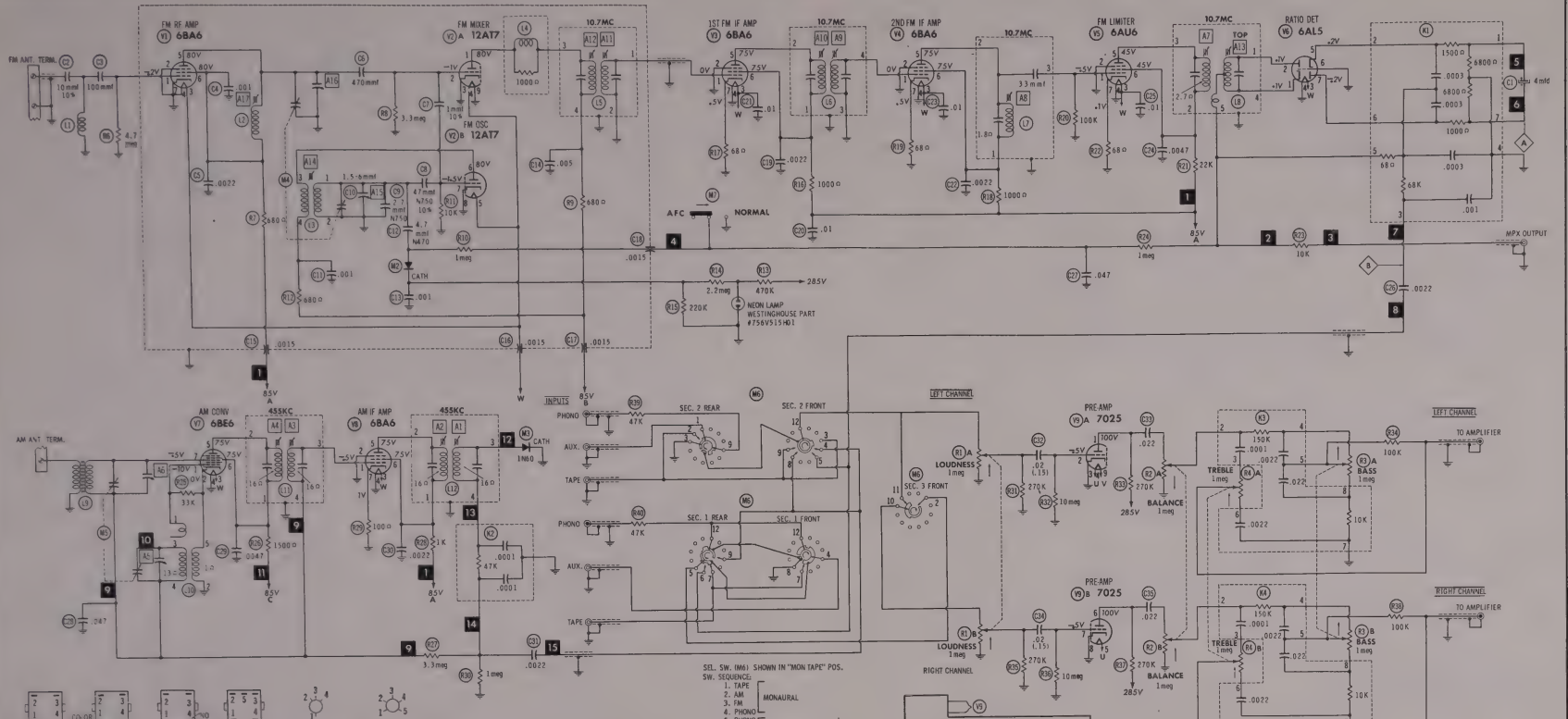
TUNER PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	4.7meg	0Ω	FIL	FIL	†4800Ω	†4800Ω	0Ω		
V2	12AT7	†4800Ω	3.3meg	0Ω	FIL	FIL	†4800Ω	10K	0Ω	FIL
V3	6BA6	1Ω	0Ω	FIL	FIL	†5100Ω	†5100Ω	68Ω		
V4	6BA6	1Ω	0Ω	FIL	FIL	†5100Ω	†5100Ω	68Ω		
V5	6AU6	100K	0Ω	FIL	FIL	†26K	†26K	68Ω		
V6	6AL5	1MF	INF	FIL	FIL	8300Ω	0Ω	7800Ω		
V7	6BE6	33K	1Ω	FIL	FIL	†5600Ω	†5600Ω	4meg		
V8	6BA6	4meg	0Ω	FIL	FIL	†5100Ω	†5100Ω	100Ω		
V9	7025	†275K	10meg	0Ω	FIL	FIL	†275K	10meg	0Ω	FIL

ALL MEASUREMENTS MADE IN "AM-FM" POSITION.
† MEASURED FROM PIN 8 OF V16.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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TUNER SCHEMATIC

WESTINGHOUSE CHASSIS V-2511-4

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier	6BA6	V6	Ratio Detector	6AL5
V2	FM Mixer-FM Osc.	12AT7	V7	AM Converter	6BE6
V3	1st FM IF Amplifier	6BA6	V8	AM IF Amplifier	6BA6
V4	2nd FM IF Amplifier	6BA6	V9	Left Channel Preamp. - Right Channel Preamp.	7025
V5	FM Limiter	6AU6			

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	4	50	218V012H13	PTT90	NLW4-50	MT1-3	TT50X4	MLV5-50	TE-1302.1

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10 10%		1469-00001	TCZ-10	22R5Q1	CM-19B-100K	MCB215	MS-41
C3	100		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C4	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C6	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C7	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C8	47 N750 10%		N750-DI 47	DTZ-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C9	2.7 N750	#215V304H02						
C10	1.5-6	#215V307H01		829-6		CV-3	CT552	
C11	.001		BPD-001	DD-102	BYA10D1	CCD-102 *	B-210	5HK-D10
C12	4.7 N470	#215V304H03						
C13	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C15	.0015		EF-0015			CCF-152		
C16	.0015		EF-0015			CCF-152		
C17	.0015		EF-0015			CCF-152		
C18	.0015		EF-0015			CCF-152		
C19	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C23	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C27	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C28	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C29	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C30	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C31	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C32	.02	(.15) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C33	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C34	.02	(.15) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C35	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C36	.033 600V		P488N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	4TM-S33

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Westinghouse Part Number.
† Alternate Value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg		270V089H01	B-70	AD47-1meg-Z		FA16A	Loudness, Left Channel
B	1meg			SR-70	Not Req.		RU16A	Loudness, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R2A	1meg		270V089H02	B-744			FA16A	Balance, Left Channel
B	1meg			SR-68			RU16R	Balance, Right Channel
C	Shaft			Not Req.			CS3500	
R3A	1meg		270V089H03	B-69	AD47-1meg-S		FA16L	Bass, Left Channel
B	1meg			SR-69	Not Req.		RU16L	Bass, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R4A	1meg		270V082H02	TPL-104			UE4183S*	Treble, Left Channel
B	1meg			Not Req.				Treble, Right Channel
R5A	250K		270V088H07	BPS-51	C47S-250K-Z	B13-130 †	PP254A	Reverberation
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	Not Req.	SK7 †	Not Req.	Reverberation Off-On

† Factory assembled Part #PPQ13-130 (SK7).
* Factory Assembled.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	4.7meg				R24	1meg			
R7	680Ω				R25	33K			
R8	3.3meg				R26	1500Ω			
R9	680Ω				R27	3.3meg			
R10	1meg				R28	1000Ω			
R11	10K				R29	100Ω			
R12	680Ω				R30	1meg			
R13	470K				R31	270K			
R14	2.2meg				R32	10meg			
R15	220K				R33	270K			
R16	1000Ω				R34	100K			
R17	68Ω				R35	270K			
R18	1000Ω				R36	10meg			
R19	68Ω				R37	270K			
R20	100K				R38	100K			
R21	22K				R39	47K			
R22	68Ω				R40	47K			
R23	10K				R41	470K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Ratio Detector Comp.	.0003mfd, .0003mfd, .0003mfd, .001mfd, 68Ω, 1000Ω, 1500Ω, 6800Ω, 6800Ω, 68K	219V036H01	Aerovox PA-694 Centralab PC-342 Sprague C-12
K2	Diode Filter	.001mfd, .001mfd, 47K	219V022H03	Aerovox PA-97 Centralab PC-50 Sprague D-1
K3	Tone Comp.	.001mfd, .0022mfd, .0022mfd, .022mfd, 10K, 150K	219V021H01	
K4	Tone Comp.	.001mfd, .0022mfd, .0022mfd, .022mfd, 10K, 150K	219V021H01	

WESTINGHOUSE CHASSIS V-2510-5, V-2510-11, V-2511-4

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke	230V065H01					① Wound on 1000Ω Res.
L2	FM RF	230V045H01					
L3	FM Osc.	230V045H02					
L4	RF Choke	230V056H17 ①					
L5	1st FM IF	235V039H03	FM-254	1463	RTC-8599	T633	
L6	2nd FM IF	235V059H01	FM-256	1463-PC	RTC-9046	T654	
L7	Limiter	235V060H01				TB645	
L8	Ratio Detector	235V061H01				TB646	
L9	Loopstick	310V055H01	BC-419	705-A		T532	
L10	AM Osc.	230V040H04				TA141	
L11	1st AM IF	235V033H04	BC-356	13-PC1	RTC-8641	T614	
L12	2nd AM IF	235V053H03	BC-357	13-PC2	RTC-8642	T615	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	Westinghouse PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	671V009H01	690V023H05 *	17D	Not Req.	26SD	S1-1D* S1-3 *	8TA4-SD	N-8TA-SD *	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		296V008H01				FM AFC
M3	1N60	296V002H06		1N60	1N60	AM Detector (Pigtail)

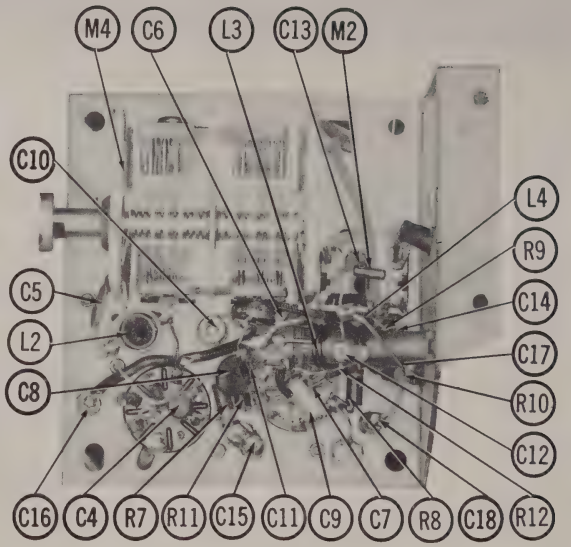
MISCELLANEOUS

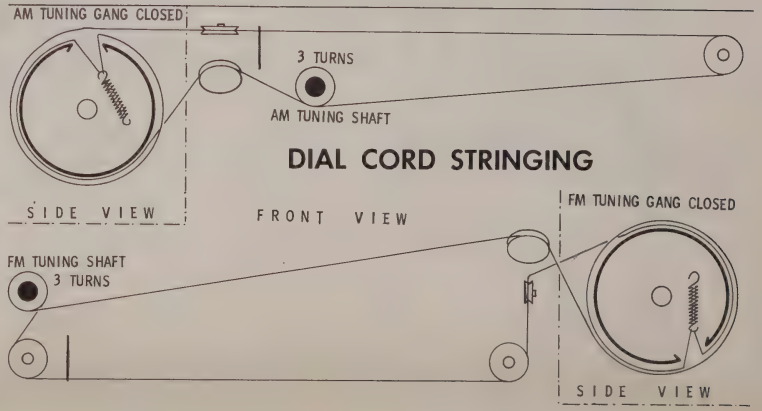
ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuning Cap.	330V016H03	FM, 2 Gang
M5	Tuning Cap.	330V015H08	AM, 2 Gang
M6	Switch	756V050H01	Function Selector (Rotary Wafer Type)
M7	Switch		AFC (Part of bracket rivet assembly Part #778V189H01)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FM RF SUBCHASSIS





DIAL CORD STRINGING

AMP CHASSIS V–2510–5 PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V10	Left Channel AF Amp. - Phase Inverter	12AX7
V11	Left Channel Output	6BQ5
V12	Left Channel Output	6BQ5
V13	Right Channel AF Amp. - Phase Inverter	12AX7
V14	Right Channel Output	6BQ5
V15	Right Channel Output	6BQ5
V16	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C37A	■80	450	218V025H49	AFH4-94-90	CU67	XC4-34	FP385.5		TVL-3816
B	■40	400			BR3035		TC77		TVA-1610
C	▲30	350							
D	10	300							
C38A	25	25	218V0449H01	PRS2075	BBRD2202	QT2-7	TCD26	TDLD-4	TVA-2434
B	25	25							
C39	70	25NP	218V025H41	PRS7340	BR8015		TCN425		TVANS-1440*
C40	4	50NP	218V025H19	PRS7405	BBR4-150	NPQT-2	TCN504		TVANS-1302.5*
C41	70	25NP	218V025H41	PRS7340	BR8015		TCN425		TVANS-1440*
C42	4	50NP	218V025H19	PRS7405	BBR4-150	NPQT-2	TCN504		TVANS-1302.5*

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C44	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C46	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C47	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C48	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C49	.047 1000V		P1088N-047		CUB10S47	16DP-5-473	GEM-10147	10TM-S47

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R42	470K			
R43	470K			
R44	330K			
R45	1500Ω			
R46	22K			
R47	1meg			
R48	56K			
R49	4700Ω			
R50	47K			
R51	1000Ω			
R52	470K			
R53	1000Ω			
R54	470K			
R55	120Ω 3W	PW3-120	3W-SQ-120	
R56	470K			
R57	470K			
R58	330K			
R59	1500Ω			
R60	22K			
R61	1meg			
R62	56K			
R63	4700Ω			
R64	1000Ω			
R65	470K			
R66	1000Ω			
R67	420K			
R68	120Ω 3W	PW5-120	3W-SQ-120	
R69	3900Ω 15W	PW15-3900	15W-SQ-3900	
R70	3900Ω			
R71	230Ω 4W	PW5-230	5W-SQ-230	
R72	330K			
R73	47K			

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L13	Tone Choke(1.5MH)	230V095H01					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V Ⓐ 1.5A	600VCT Ⓐ .220A DC	5V Ⓐ 3A	410V027H01					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V Ⓐ 2.8A	6.3VCT Ⓐ 3.9A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	9000Ω CT	6-8Ω CT	430V104H02					
T3	9000Ω CT	6-8Ω CT	430V104H01					

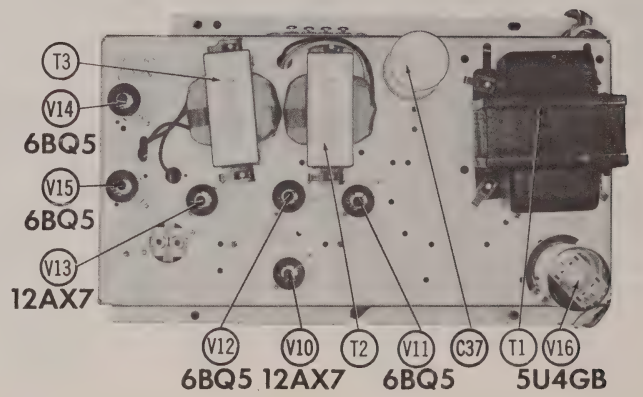
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	Westinghouse PART No.	GUAM PART No.	NOTES
SP1	7"	PM	6-8Ω	570V074H02		
SP2	4"	PM	6-8Ω	570V071H01	4A1Z6.4	
SP3	15"	PM	3-4Ω	570V091H01	15A10LZ3.2	
SP4	7"	PM	6-8Ω	570V074H02		
SP5	4"	PM	6-8Ω	570V071H01	4A1Z6.4	

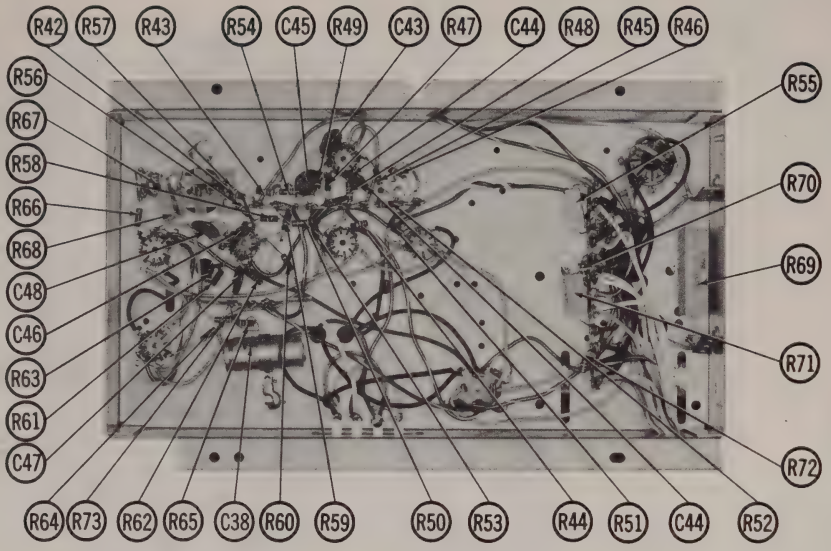
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

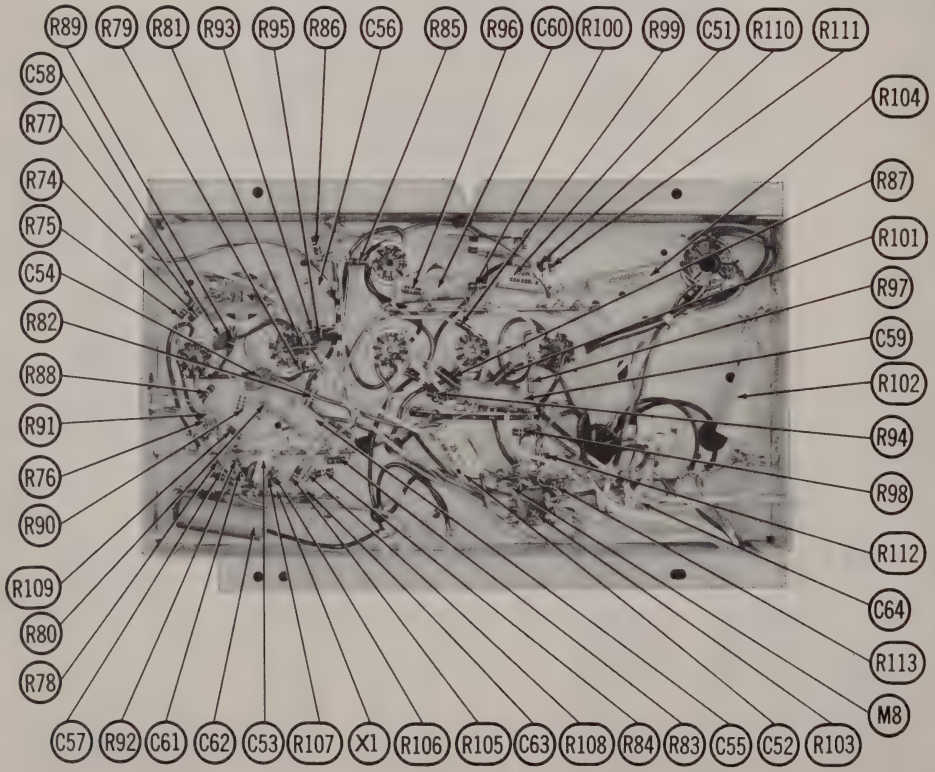
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



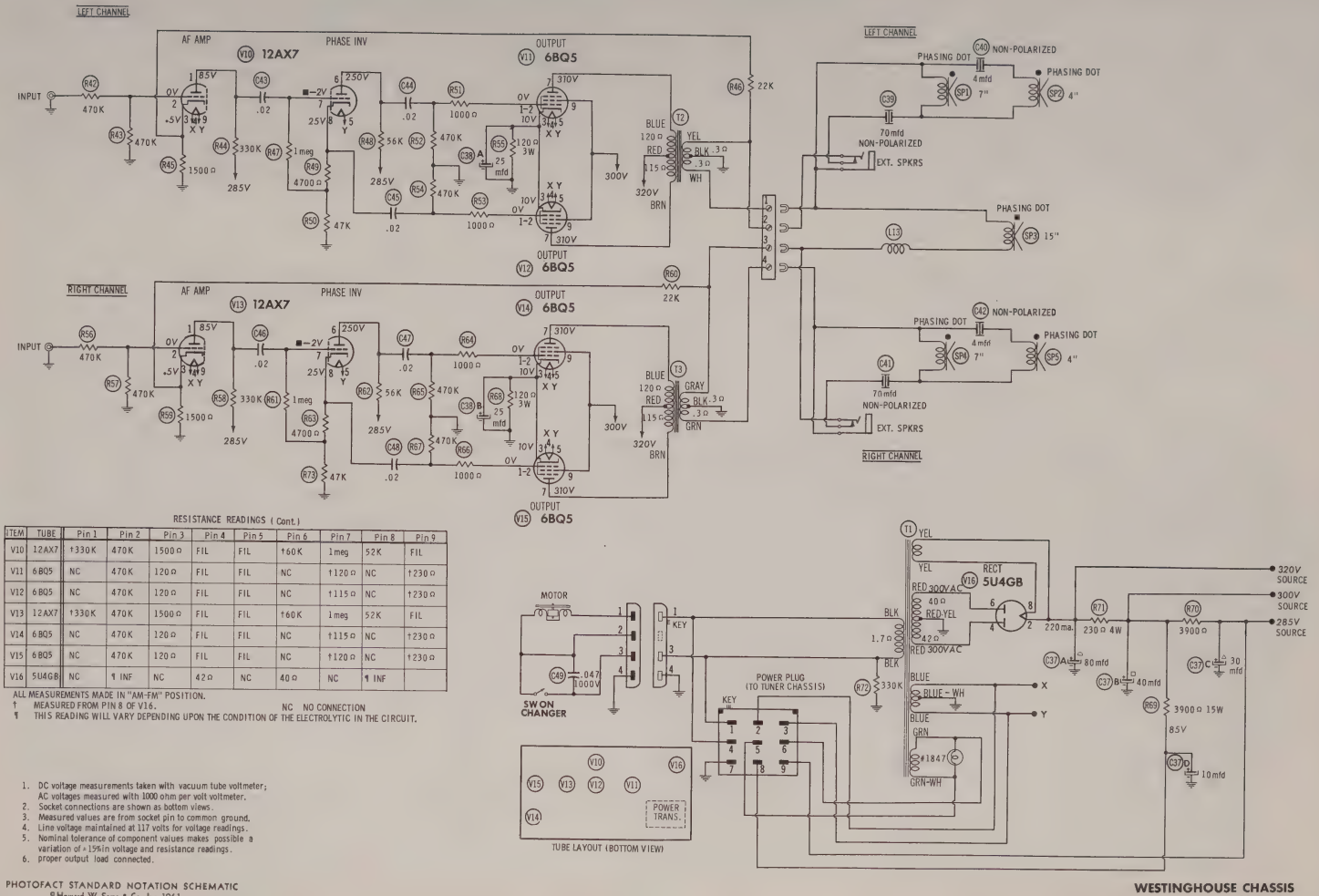
AMP CHASSIS V–2510–5 TOP VIEW



AMP CHASSIS V-2510-5 -BOTTOM VIEW



AMP CHASSIS V-2510-11 -BOTTOM VIEW



RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V10	12AX7	†330K	470K	1500Ω	FIL	FIL	†60K	1meg	52K	FIL
V11	6BQ5	NC	470K	120Ω	FIL	FIL	NC	†120Ω	NC	†230Ω
V12	6BQ5	NC	470K	120Ω	FIL	FIL	NC	†115Ω	NC	†230Ω
V13	12AX7	†330K	470K	1500Ω	FIL	FIL	†60K	1meg	52K	FIL
V14	6BQ5	NC	470K	120Ω	FIL	FIL	NC	†115Ω	NC	†230Ω
V15	6BQ5	NC	470K	120Ω	FIL	FIL	NC	†120Ω	NC	†230Ω
V16	5U4GB	NC	¶ INF	NC	42Ω	NC	40Ω	NC	¶ INF	

ALL MEASUREMENTS MADE IN "AM-FM" POSITION.
† MEASURED FROM PIN 8 OF V16.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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WESTINGHOUSE CHASSIS V-2510-5

AMP CHASSIS V-2510-5 SCHEMATIC

AMP CHASSIS V–2510–11 PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V17	Left Channel AF Amp. - Right Channel AF Amp.	12AX7 (7025) *
V18	Left Channel Phase Inv. - Right Channel Phase Inv.	12AX7 (7025) *
V19	Left Channel Output	6BQ5
V20	Left Channel Output	6BQ5
V21	Right Channel Output	6BQ5
V22	Right Channel Output	6BQ5
V23	Rectifier	5U4GB

* Alternate

TRANSISTORS

ITEM No.	MFGR. PART NO.	USE	REPLACEMENT DATA: RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	297V004H03	Reverb Amp.				PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C50A	▲80	475	218V037H09	AFH4-94-90	C1167	XC4-34	FP385.5		TVL-3816
B	■40	450			BR3035		TC77		TVA-1610
C	▲10	400							
D	30	350							
C51	25	50	218V025H55	PRS1340	BBR25-50	QT1-11	TC36	TD-25-50	TVA-1306
C52	25	50	218V025H55	PRS1340	BBR25-50	QT1-11	TC36	TD-25-50	TVA-1306
C53	5	12	218V048A03	PTT51	NLW5-15	MT1-3	TT12X5	MLV5-12	TE-1127

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C54	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C55	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C56	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C57	22 10%		NPO-SI 22	TCZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C58	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C59	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C60	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C61	22 10%		NPO-SI 22	TCZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C62	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C63	.0022		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C64	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C65	.047 1600V		P1684M-047		CUB16S5	16DP-5-503	GEM-1615	TR-15

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R74	100K			
R75	100K			
R76	330K			
R77	4700Ω			
R78	220K			
R79	1meg			
R80	68K			
R81	2200Ω			
R82	68K			
R83	1000Ω			
R84	100K			
R85	1000Ω			
R86	100K			
R87	10Ω 1W			
R88	100K			
R89	100K			
R90	330K			
R91	4700Ω			
R92	220K			
R93	1meg			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R94	68K			
R9	2200Ω			
R96	68K			
R97	1000Ω			
R98	100K			
R99	1000Ω			
R100	100K			
R101	10Ω 1W			
R102	3300Ω 15W	PW15-3300	15W-SQ-3300	
R103	5600Ω			
R104	1500Ω 10W	PW10-1500	10W-SQ-1500	
R105	68K			
R106	47K			
R107	4700Ω			
R108	4700Ω			
R109	220K			
R110	15Ω			
R111	47Ω			
R112	12K			
R113	33K			

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	RATING: SEC. 4	RATING: SEC. 5	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	117V ⓐ 1.4A	700VCT ⓐ .150A DC ⓐ 18V ⓐ .001A DC	5V ⓐ 3A	6.3VCT ⓐ 3.9A	6.3V ⓐ 2.8A		410V019H01					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Westinghouse PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7500Ω CT	6-8Ω	430V095H01	A-2905	A-3880	24S42	S-55X ①	① Drill New Mounting Hole(s).
T6	7500Ω CT	6-8Ω	430V095H01	A-2905	A-3880	24S42	S-55X ①	

AMP CHASSIS V–2510–11 PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP6	12"	PM	6-8Ω	570V081H01	12A6PA	
SP7	7"	PM	10-12Ω	570V033H01	7A2IZI2	
SP8	HORN		14-16Ω	570V083H01		
SP9	12"	PM	6-8Ω	570V081H01	12A6PA	
SP10	7"	PM	10-12Ω	570V033H01	7A2IZI2	
SP11	HORN		13-16Ω	570V083H01		

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Westinghouse PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M8	.001A	295V020H01	1N1763	2F4	SR200	

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M9	Reverberation Unit	753V024H01	

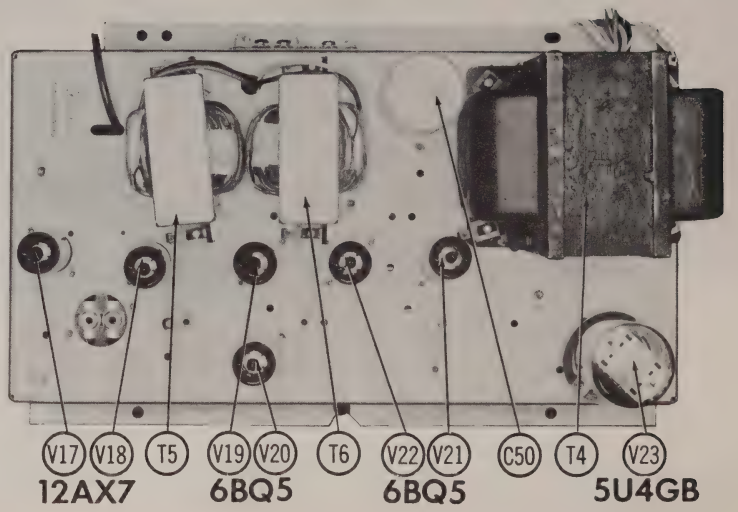
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

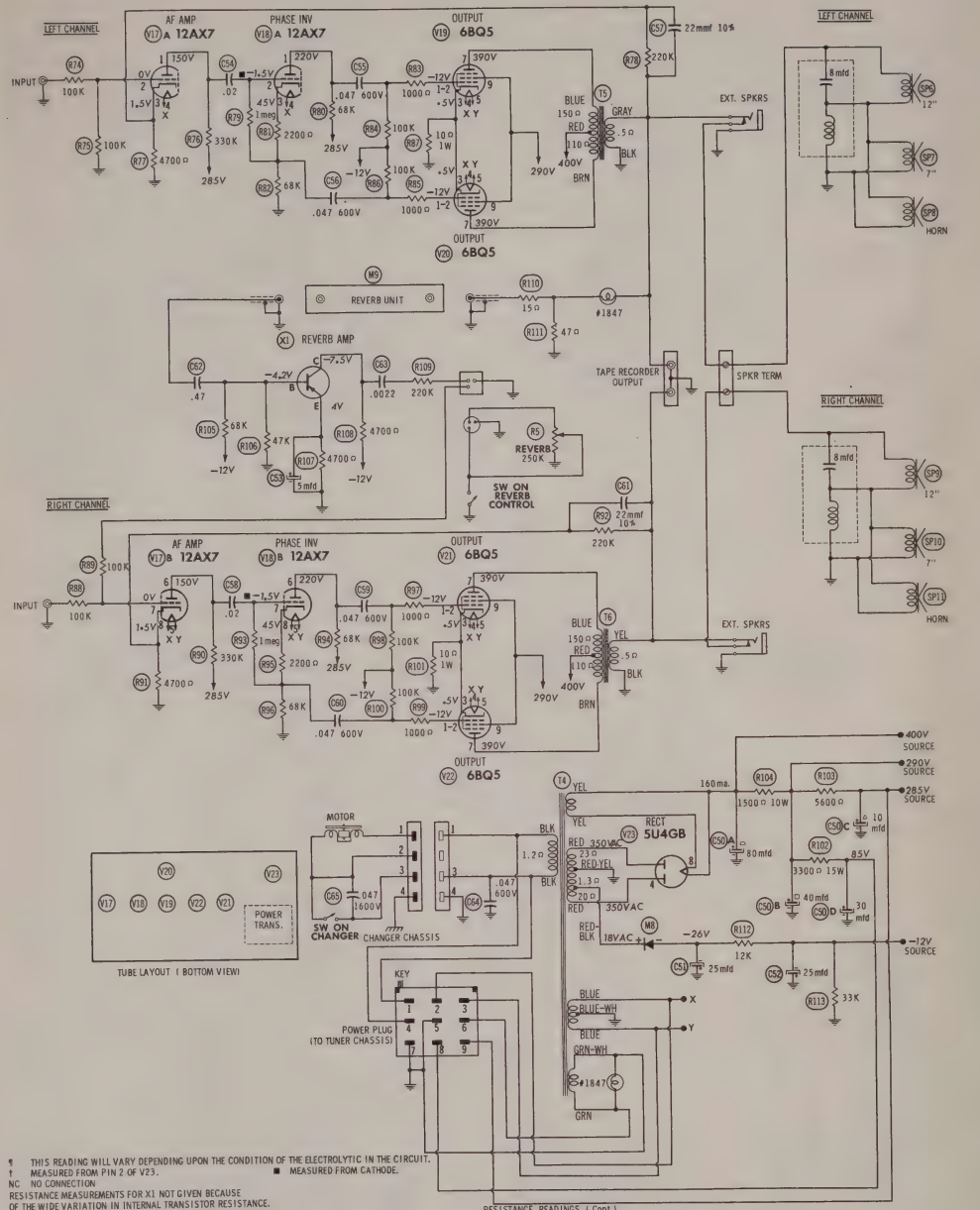
NAME	PART NO.	DESCRIPTION
Dial Pointer	558V270H01	
Dial Crystal	559V079H01	
Knob	550V135H03	Tuning
Knob	550V137H01	Function
Knob	550V114H05	Loudness, Bass, Treble, Balance (Top)
Knob	559V071H01	Loudness, Bass, Treble (Bottom) Models H-M1500 Series
Knob	559V070H01	Loudness, Bass, Treble (Bottom) Models H-M1600 Series
Knob	550V175H01	Reverberation, Model H-M1600 Series
Knob	559V070H01	Balance (Bottom)
Cabinet	516V212H01	Model H-M1510
Cabinet	516V213H01	Model H-M1511
Cabinet	516V215H01	Model H-M1512
Cabinet	516V214H01	Model H-M1513
Cabinet	516V217H01	Model H-M1600
Cabinet	516V218H01	Model H-M1601
Cabinet	516V253H01	Model H-M1602
Cabinet	516V255H01	Model H-M1603
Cabinet	516V225H01	Model H-M1604

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)



AMP CHASSIS V–2510–11 TOP VIEW



¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V23. ■ MEASURED FROM CATHODE.
NC NO CONNECTION
RESISTANCE MEASUREMENTS FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V17	12AX7	†330K	100K	4700Ω	FIL	FIL	†330K	100K	4700Ω	FIL
V18	12AX7	†75K	1meg	70K	FIL	FIL	†75K	1meg	70K	FIL
V19	6BQ5	NC	130K	10Ω	FIL	FIL	NC	†150Ω	NC	†1500Ω
V20	6BQ5	NC	130K	10Ω	FIL	FIL	NC	†110Ω	NC	†1500Ω
V21	6BQ5	NC	130K	10Ω	FIL	FIL	NC	†150Ω	NC	†1500Ω
V22	6BQ5	NC	130K	10Ω	FIL	FIL	NC	†110Ω	NC	†1500Ω
V23	5U4GB	NC	¶ 70K	NC	21.3Ω	NC	23Ω	NC	¶ 70Ω	

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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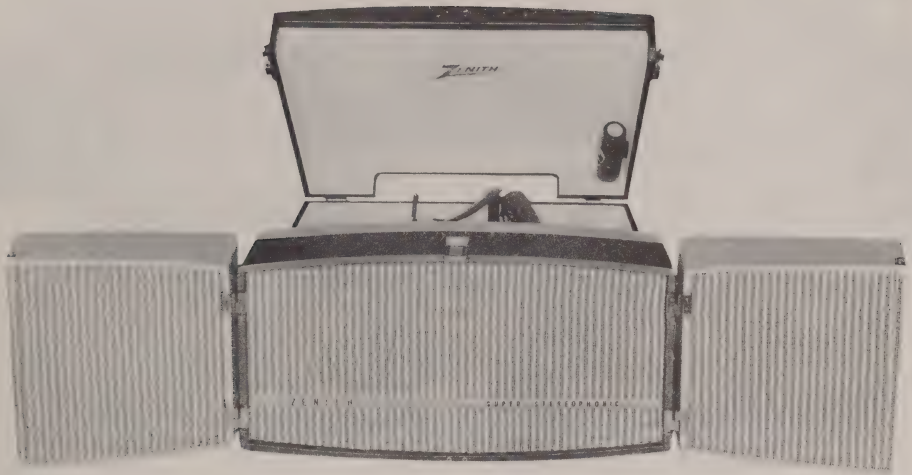
WESTINGHOUSE CHASSIS V-2510-11

AMP CHASSIS V-2510-11 SCHEMATIC

PHOTOFACT® Folder

ZENITH MODEL FPS-80C

ZENITH MODEL FPS-80C



ZENITH MODEL FPS-80C

TRADE NAME	Zenith Model FPS-80C
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles RATING 36 Watts, .36 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER 169-141 — SEE SIMILAR V-M1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 559 FOLDER 17

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KT803

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7A	V3	Right Channel Output	6AQ5A
V2	Left Channel Output	6AQ5A	V4	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲30	350	WC14244	PWH3-110-30	C0840	XC3-24	FP342.5	TMT-3364	TVL-3636.3
B	■15	300							
C	▲25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	22		DI-22	DD-220	L10Q22	CCD-220	GP422	10TS-Q22
C3	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C4	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	22		DI-22	DD-220	L10Q22	CCD-220	GP422	10TS-Q22
C6	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C7	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10

CONTROLS

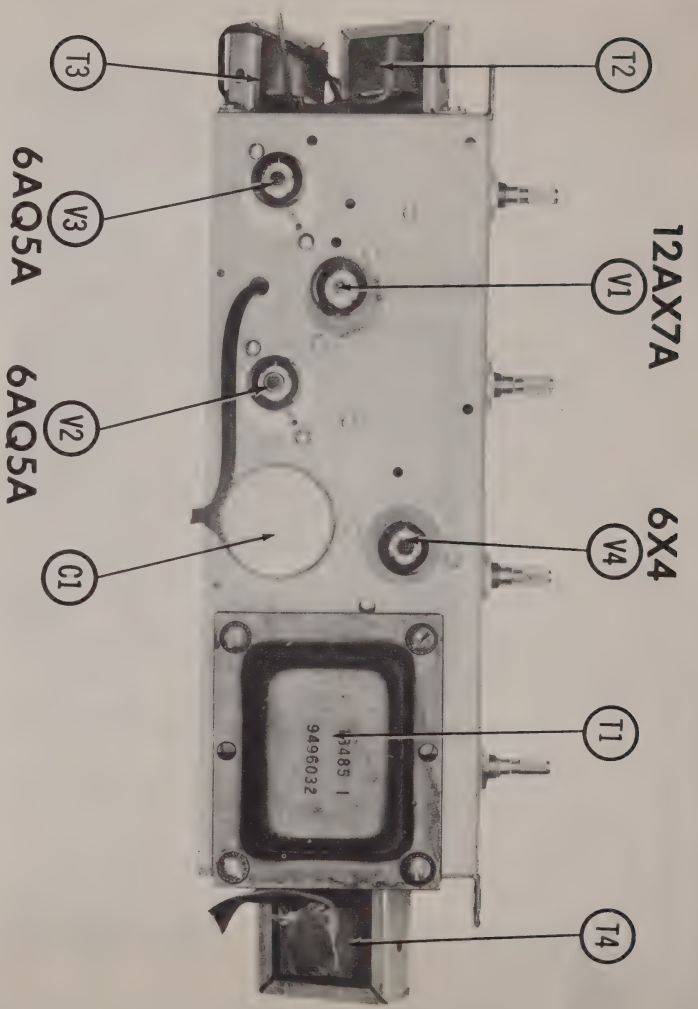
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg		WC13229	B-88	AD47-5meg-S		FB56A	Volume, Left Channel
B	5meg			SR-88	Not Req.		RU56A	Volume, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R2A	500K		WC13800	B-60	AD47-500K-Z		FB55A	Treble, Left Channel
B	500K			SR-60	Not Req.		RU55A	Treble, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	5meg		WC13229	B-88	AD47-5meg-S		FB56A	Bass, Left Channel
B	5meg			SR-88	Not Req.		RU56A	Bass, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	1meg		WC13501	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	270K				R12	270K			
R6	2.2meg				R13	2.2meg			
R7	100K				R14	100K			
R8	330Ω				R15	330Ω			
R9	82K				R16	82K			
R10	150Ω 2W				R17	47Ω			
R11	47Ω				R18	10K 1W			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .36A	480VCT @ .060A DC	6.3VCT @ 1.8A	WC13485		PM-8404①	24R13①	R-110B ①	① Tape 5V Winding

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3400Ω	3-4Ω	WC14164	A-3025	A-3850①	24S48	S-41Z	① Drill New Mounting Hole(s).
T3	3600Ω	3-4Ω	WC14163	A-3025	A-3850①	24S48	S-41Z	
T4	7800Ω CT	3-4Ω	WC14245	A-2901	A-3823	24S06	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	WC14256	52A1	
SP2	8"	PM	3-4Ω	WC13975	8A21	
SP3	5 1/4"	PM	3-4Ω	WC14256	52A1	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	ZENITH PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	142-111	56-436* (LP)	17	Not Req.	26S	2604*	8TA4-S	N-8TA-S *	
		56-438* (78RPM)				2605*			

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Switch Spindle	S-46112	Stereo-Monaural 45 RPM

CABINETS & CABINET PARTS

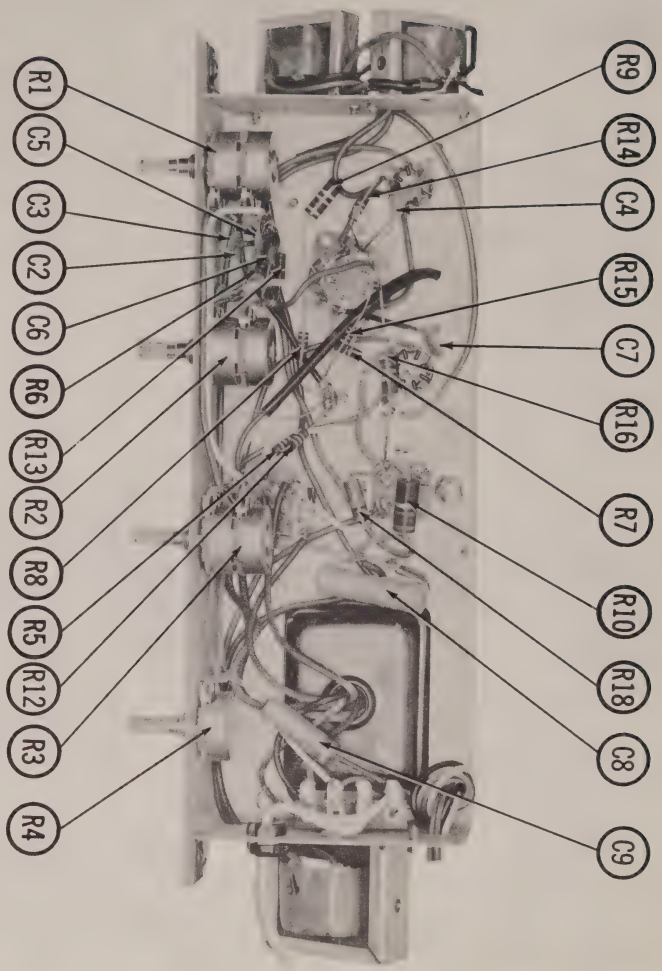
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

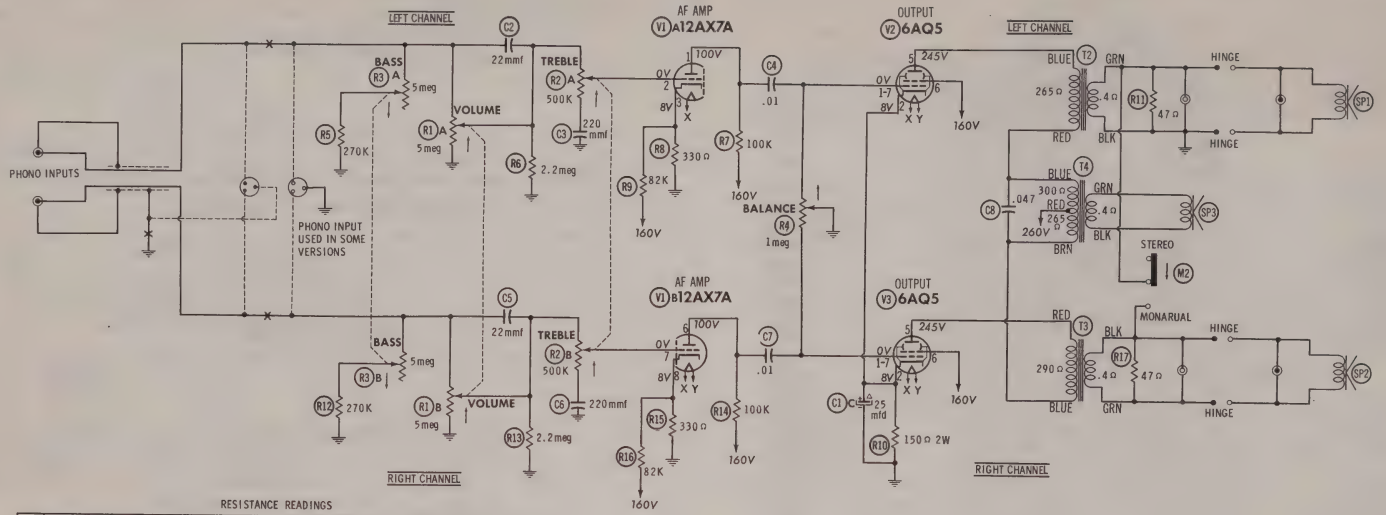
NAME	PART NO.	DESCRIPTION
Knob	WC13132-9KA	Loudness, Bass, Treble
Knob	WC13132-9KB	Balance
Cabinet	WC14700	
Handle	WC14263-8B	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW

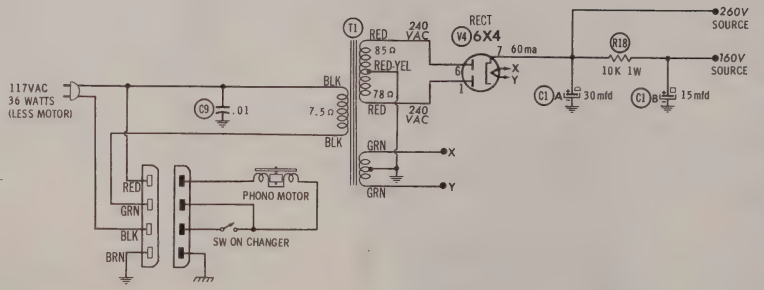




RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†110K	500K	330Ω	FIL	FIL	†110K	500K	330Ω	FIL
V2	6AQ5A	500K	150Ω	FIL	FIL	†565Ω	†10K	500K		
V3	6AQ5A	NC	150Ω	FIL	FIL	†555Ω	†10K	500K		
V4	6X4	78Ω	NC	FIL	FIL	85Ω	NC	¶ 50K		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4. NC NO CONNECTION



ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
(CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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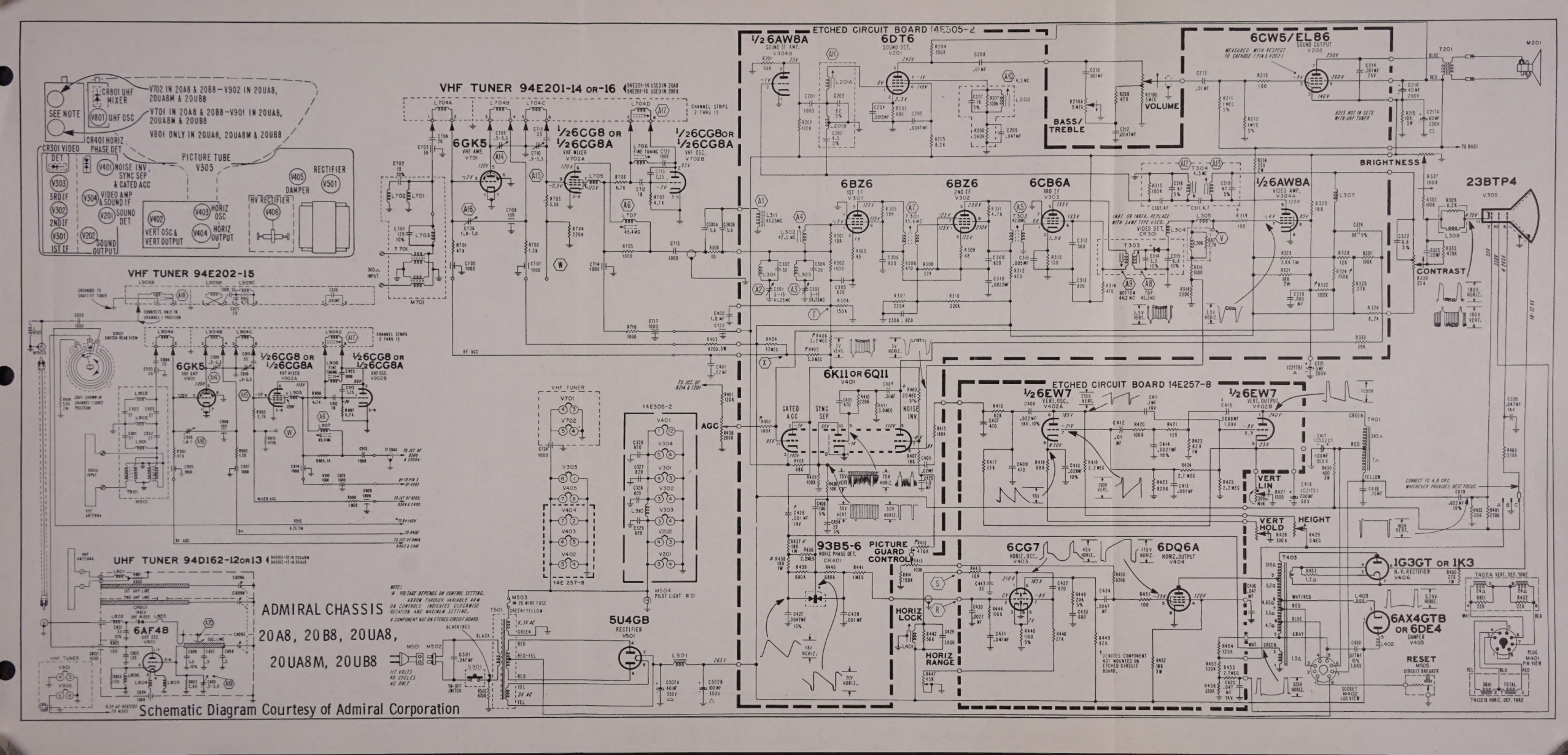
ZENITH MODEL FPS-80C


ADMIRAL CHASSIS
20A8, 20B8, 20UA8,
20UA8M, 20UB8
Schematic Diagram Courtesy of Admiral Corporation
ETCHED CIRCUIT BOARD 14E305-2
ETCHED CIRCUIT BOARD 14E257-8
VHF TUNER 94E201-14 OR-16
VHF TUNER 94E202-15
UHF TUNER 94D162-12 OR 13
1/2 6AW8A
6DT6
6CW5/EL86
6GK5
1/2 6CG8 OR 1/2 6CG8A
6BZ6
6CB6A
6K11 OR 6Q11
1/2 6EW7
6CG7
6DQ6A
6AF4B
5U4GB
93B5-6
23BTP4
1G3GT OR 1K3
6AX4GTB OR 6DE4
BASS/TREBLE
VOLUME
BRIGHTNESS
CONTRAST
VERT HOLD
HEIGHT
VERT LIN
HORIZ LOCK
HORIZ RANGE
PICTURE GUARD CONTROL
RESET
SEE NOTE
PICTURE TUBE V305
HV RECTIFIER
AGC

← ADMIRAL ADMIRAL

SCHEMATIC NOTES

Numbers or letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in microfarads ± 20% unless otherwise specified.

VOLTAGES AND WAVEFORMS

Line Voltage: 117.
Channel Selector on unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Picture Guard or Horizontal Hold controls.
Antenna disconnected and terminals shorted.
DC voltages measured with VTVM between tube socket and chassis, unless otherwise indicated.
Voltages marked (*) will vary widely with control settings.
Waveforms taken with transmitted signal input. For waveforms, controls set for normal picture.
Peak-to-peak voltages may vary slightly.

VHF TUNER 94E203-2

VHF TUNER 94E200-22

UHF TUNER 94D204-2

ETCHED CIRCUIT BOARD 14E305-1

ETCHED CIRCUIT BOARD 14E257-8

ADMIRAL CHASSIS 19B8B, 19UB8B

Schematic Diagram Courtesy of Admiral Corporation

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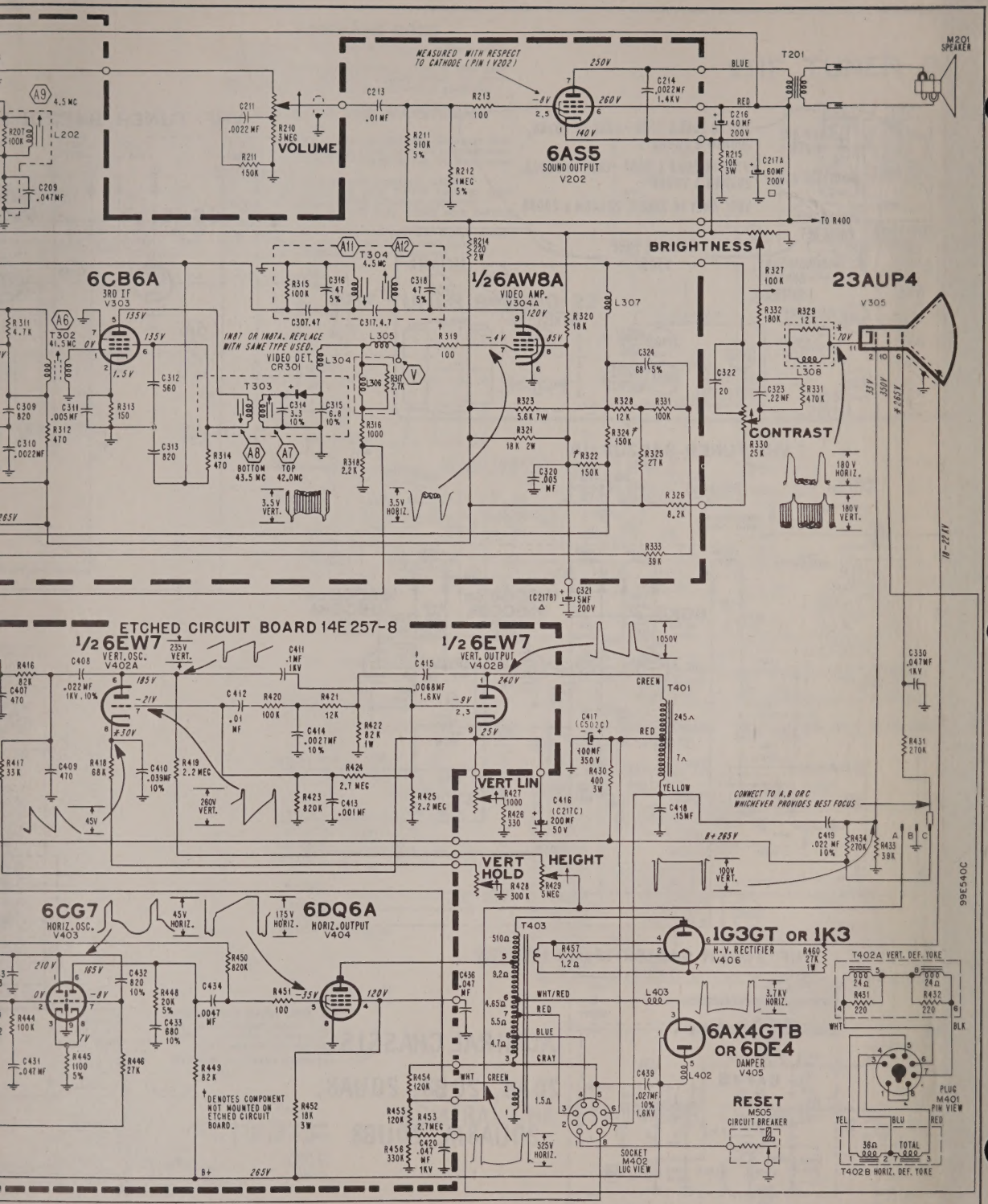
SET 559 FOLDER 18-S



Schematic Diagram Courtesy of Admiral Corporation